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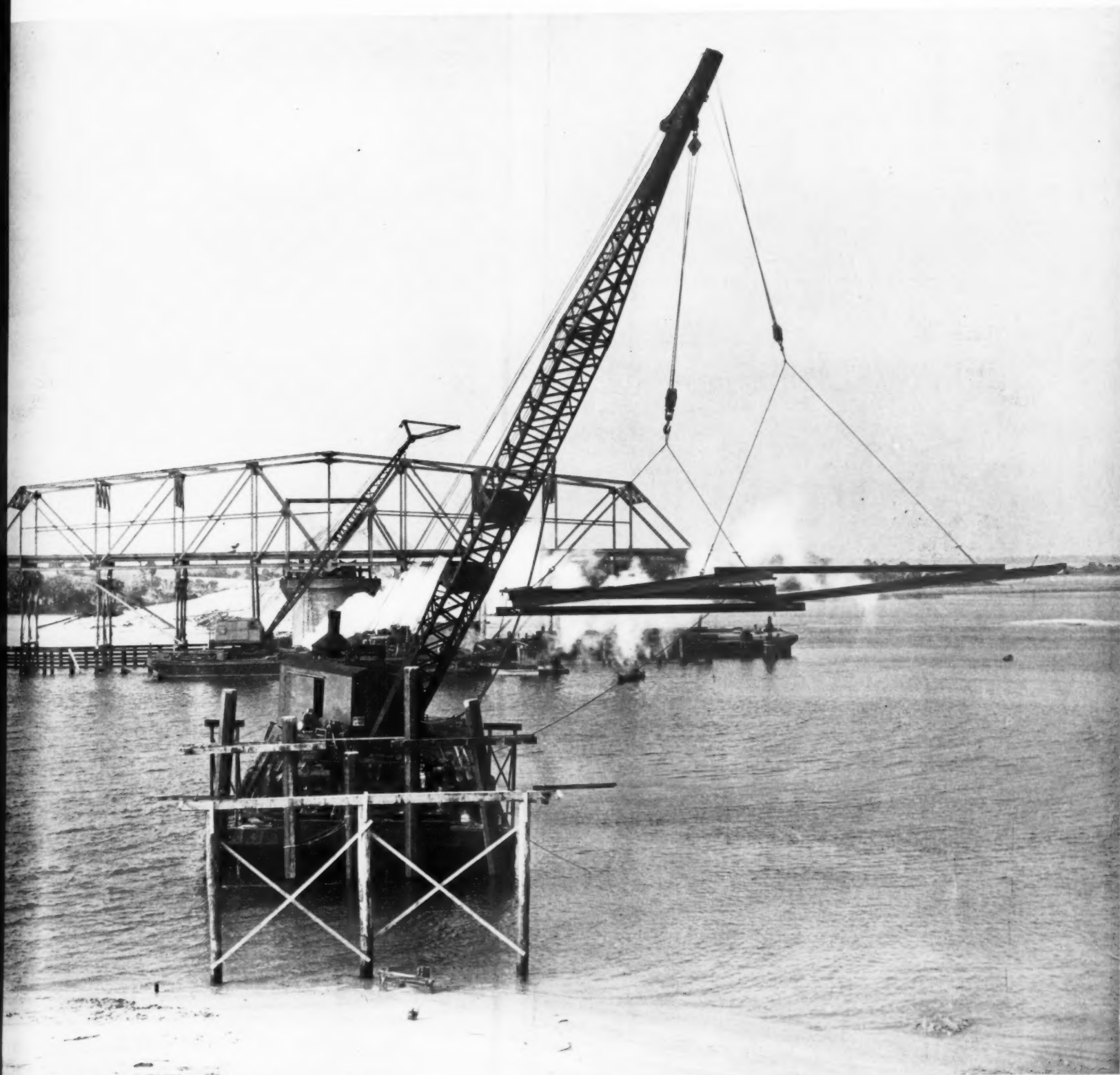
JUL 16 1956

SCIENCES

# Contractors and Engineers

magazine of modern construction

JULY 1956

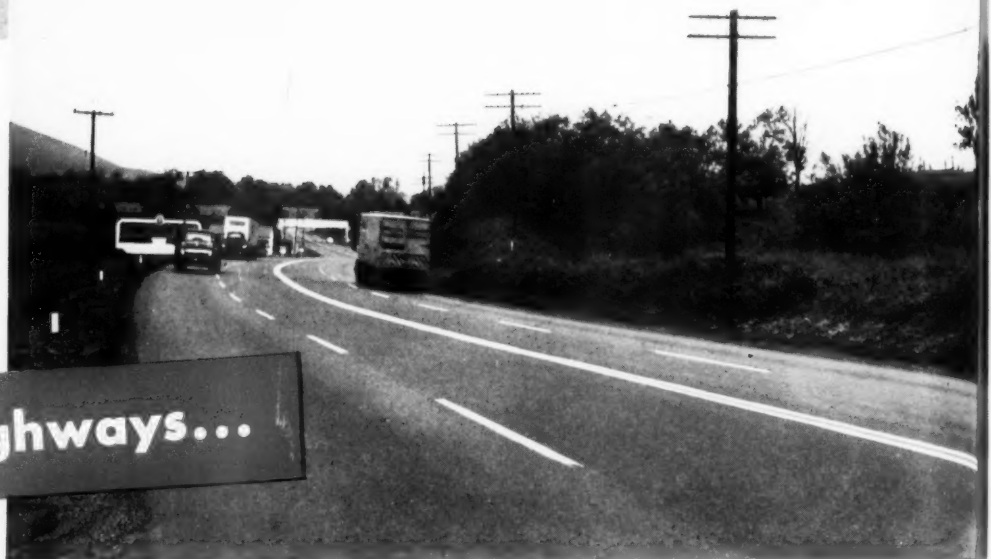


**On important city streets...**



Heavy-duty plant-mixed Texaco Asphalt pavement on McIrose Avenue, Roanoke, Va. Used by traffic to by-pass the center of the city.

U. S. Route 11, near Cloverdale, one of Virginia's principal north-south highways, also paved with heavy-duty plant-mixed Texaco Asphalt.



**on busy trunk highways...**

## Virginia's heavy traffic rides on resilient Texaco Asphalt

On many of Virginia's most heavily traveled highways and streets, plant-mixed Texaco Asphalt pavements are demonstrating their rugged durability.

One type of flexible, heavy-duty Texaco Asphalt construction in particular, which serves Virginia's principal east-west truck route, merits special mention. Briefly, a sand-clay subbase is laid on the road and primed with Texaco Rapid-curing Cutback Asphalt. This is followed by a 7½-inch foundation of coarse-graded, plant-mixed Texaco Asphaltic Concrete. The wearing surface is a 1½-inch thickness of plant-mixed Texaco Sand-Asphalt.

This completely flexible, skid-resistant, joint-free pavement is recommended wherever heavy traffic must be served. A fine-aggregate asphaltic concrete surface may be substituted for the sand-asphalt.

Helpful information for the road builder on methods and materials recommended for all types of Asphalt construction is supplied in two free Texaco booklets. Copies may be obtained without obligation by writing our nearest office.



**THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York 17**  
**Boston 16** (20 Providence St.) • **Chicago 4** (332 So. Michigan Ave.) • **Houston 1** (720 San Jacinto St.)  
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**Richmond 19, Va.** (Mutual Assurance Society Bldg.) • **Minneapolis 3** (Groveland Ave.-Clifton Pl.)



# TEXACO ASPHALT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 201



# Contractors and Engineers

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*magazine of modern construction*

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Reconstruction of highway.

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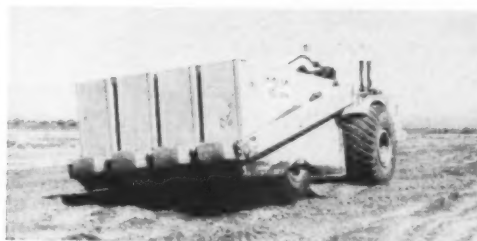
Warehouse goes up.

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## Why not call a spade a spade?

Engineers and constructors are noted for their frankness and their straightforward approach to problems. It's ironic that specifications are sometimes so written that they produce misinterpretations and conflict for these men.

The situation is sometimes the result of reluctance on the part of specification writers—especially those in public works—to use the trade names of recognized and accepted equipment when writing specifications. The situation that results is often like one that occurred recently on a Midwestern paving contract.

The state highway specifications provided that the concrete-curing compound be applied by a power sprayer carried on the paving forms. Obviously, the specification writer was picturing equipment like the Flex-Plane self-propelled automatic curing machine.

But the curing subcontractor, who had been working under the specifications of another agency, showed up on the job with two small gasoline-powered sprayers equipped with hand-held spray bars. Using one on each side of the new slab, this subcontractor proposed to apply the curing compound with the hand sprays.

The project engineer immediately objected, pointing to the specification requirement that the curing spray machine must be carried on the forms, and demanding that the subcontractor secure an approved machine. The

subcontractor, reading the specification literally and ignoring what it implied, mounted his two power sprayers on an old rolling bridge and proceeded to apply the curing compound by hand.

The fireworks that followed involved the general contractor and state highway officials, as well as the subcontractor and the project engineer. After threats and counterthreats, the hand spray curing was permitted for the remainder of the job, with the proviso that no such interpretation of the specifications would be permitted in the future.

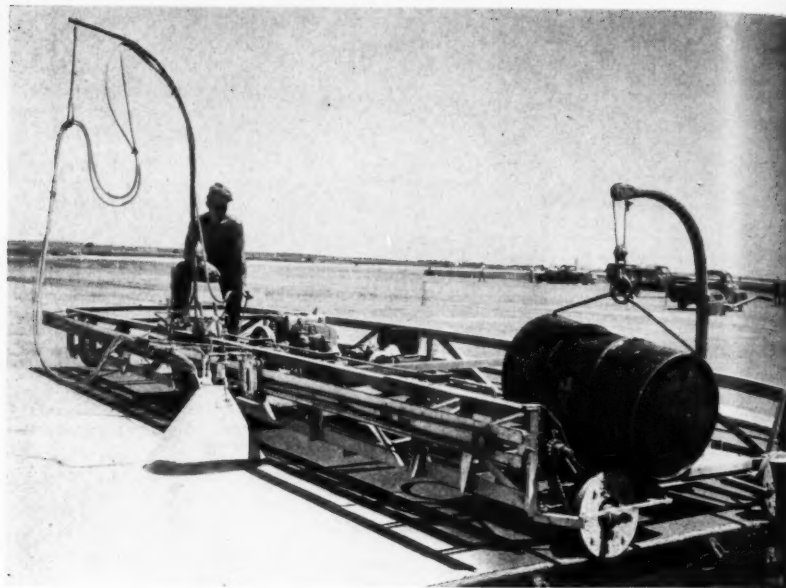
How simple this situation would have been had the specification writer said, "... by a Flex-Plane self-propelled automatic curing spray machine or other equal and approved device." Not only would the state have secured the desired results, but also the unpleasant situation in the field would have been entirely avoided.

Situations similar to this one often arise when public agencies purchase equipment. When a busy department head is asked to write a specification for a new piece of equipment needed by his department, he and his workmen usually know the trade name of the piece of equipment they really want. But, to eliminate criticism from the public, and especially from manufacturers, he attempts to write a de-

tailed specification. In it he may outline such things as engine displacement, maximum or minimum weight, tire size, method of operation, and limitless other qualifications. In so doing, he may inadvertently throw the field open to equipment not at all suited to the requirements of the department, or he may eliminate some very suitable machine.

How much simpler and more exact it would be to specify, for example, "an Earthworm Model H20 tractor-shovel or equal". Under this type of specification, manufacturers would simply have to establish that their machines can perform the same work as the equipment mentioned. The specification also assures the department that it will get a piece of equipment that will do what is expected of it. Finally, the taxpayer is assured, through competition, that he is getting his money's worth.

Dishonest public officials can use either method for their own advantage, but honest public officials can find simplicity, safety, and economy by determining their actual needs, then specifying by trade name "or equal" a machine that they know will do the job. Public officials, manufacturers, and public would all benefit if specification writers could call a spade a spade.



A barge-mounted Marion crane with an 85-foot boom positions a template between a concrete pile bent and timber falsework during construction at the east end of the Hilton Head Toll Bridge, Bluffton, S. C. The different elevations of piles in the bent indicate the variations in the limerock stratum. In the background is the 250-foot swing span across Skull Creek. Page 46

### CONTRACTORS AND ENGINEERS

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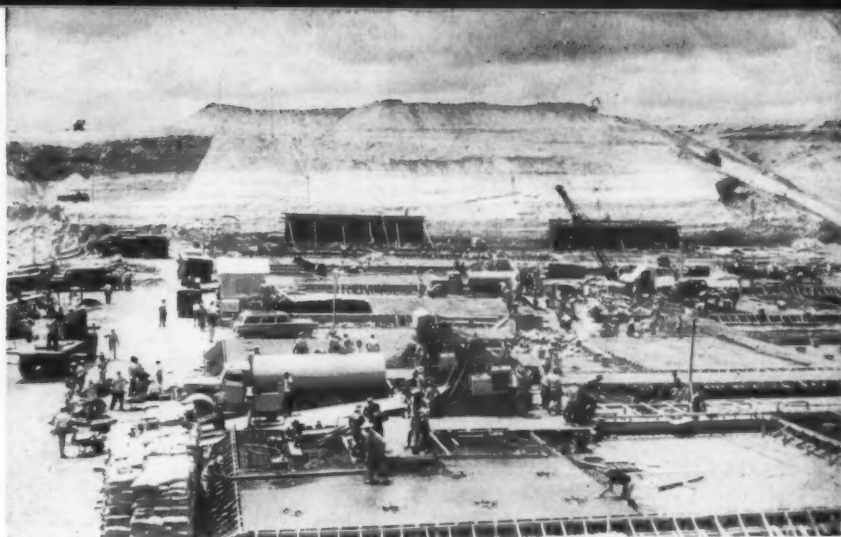
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CONTRACTORS AND ENGINEERS





Atop the crest of the dam, Caterpillar tractors pull sheepfoot rollers to compact the earth fill and rock.



Workmen rush the concrete spillway to completion. In the background is part of the 9-mile-long dam, which has started impounding waters of the Guarico River.

## Crews work night and day to finish 9-mile earth-fill dam

Working round-the-clock, construction men completed their jobs on the earth-fill portion of Guarico Dam near Calabozo, Venezuela, just before the start of the tropical rainy season this month. Meeting this deadline on South America's largest earth-fill structure required one of the largest spreads of earthmoving equipment—including scrapers, trucks, tractors, earthmovers, and rollers—to work at an almost feverish pace.

This month—two years from the start of construction—the 9-mile-long dam stands ready to control flood water of the Guarico River during the rainy season and irrigate approximately 470 square miles of land during the dry months.

The \$50,000,000 dam, the largest of its type in South America, is being built with funds derived from oil revenue. It is 100 feet high at its highest point and has a width of 560 feet at the crest and 660 feet at the base for its entire length of 9 miles. At the southernmost end, near Calabozo, ten sluice gates—each 15 feet high—will control the water. All the gates are electrically operated and automatically controlled. Two concrete towers provide the intakes for irrigation water and feed it into 14-foot steel tubes which carry water to the main irrigation canal about four miles below Calabozo. Altogether, some 290 miles of canal will distribute water over 300,000 acres.

The fresh water made available from the 94-square-mile lake that will be formed behind the dam will virtually revolutionize agriculture in Venezuela, making it possible to increase foodstuff production by 540 per cent in this area. Eighty per cent of the land will be used for grazing purposes; the remainder will be used for farming.

Important to the country—though supplemental to dam construction—are the new roads which had to be built in the region to accommodate construction equipment. One 50-mile-long road, which runs along the top of the dam, was originally built so that rock could be hauled to the site of earth-fill operations. Soon, it will become part of the main highway leading to Caracas, capital of the country, 190 miles away.

THE END

14.8 MILLION YARDS TO MOVE, 56 BRIDGES TO BUILD,

IN 29.6 MILE DALLAS-FORT WORTH "SIX-CHUTER"!



Unlike most other turnpikes, the 6-lane Lone Star Speedway is being cut, filled, borrowed and spanned along a populated route, crisscrossed by many heavily travelled roads. To add to contractors' headaches, up to 300,000 gallons of water a day have to be trucked in for compacting. Note how self-propelled scrapers are *tandem*ed to tackle the sun-hardened soil. Tires are Goodyear's wide-base Hard Rock Lugs—now standard on much original equipment.

Tire maintenance in field helps construction men bear tight work schedule.



OTHER 3-T NYLON CORD TIRES—CONVENTIONAL OR TUBELESS!

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ALL-WEATHER

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Look for this nearby Goodyear dealer sign for better tire values—better tire care.

End tube and flap troubles FOREVER!  
Specify Goodyear 3-T NYLON CORD TUBELESS TIRES  
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Goodyear tubeless tires and rims are now *standard* on foremost original equipment—or supplied on specification.

In them, you get the regular Goodyear cost-cutting features PLUS many *new* savings of time, trouble and tire-cost-per-yard, possible only with Goodyear TUBELESS.

TO MENTION JUST A FEW: No tube or flap troubles—no tube replacements—easier mounting and dismounting—airtight assembly—cooler running—slow leaks instead of blowouts—easier repairs—simpler, re-usable valve-parts.

Get all the facts from your helpful Goodyear dealer. Goodyear, Truck Tire Dept., Akron 16, Ohio.

Buy and Specify

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MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Road Lug, Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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Widening the existing portion of U. S. 422 from 30 to 52 feet was the first job tackled. An Apsco machine spreads base-course material in the 11-foot widening ditch as a second truck waits on the 6-foot median.



Base material is compacted for the new lane by a Huber 10-ton tandem-wheel roller. The 6-inch subbase material consists of crushed slag, which was topped with 12 inches of material passing the No. 4 sieve.

C&E Staff Photos

## Widening and paving converts two-lane road to dual highway

*Traffic keeps moving as 4-mile stretch of highway is reconstructed; both reinforced-concrete and bituminous pavements are laid*



Work starts on the 7,700-foot relocated stretch as a Buckeye subgrader, powered by a Hercules engine, rides the Heltzel 10-inch steel forms.



A Buffalo-Springfield 10-ton tandem roller compacts the subgrade between the forms before the final elevation is checked with scratch boards.



After concrete has been spread on the subgrade, the Koehring 34-E paver moves back to dump concrete on top of wire reinforcing that has been placed 2 inches below the forms.



Just behind the Blaw-Knox spreader, which levels the concrete to a 10-inch depth, comes a Blaw-Knox transverse finisher. Aluminum lutes and a burlap drag complete the operation.

In widening, relocating, and paving a 4½-mile section of U. S. 422 near Swatara, Pa., F. D. Kessler, Inc., Northumberland, Pa., made maximum use of mechanical methods to speed the work, yet kept traffic flowing through the project until construction was completed.

Traffic was hardly disturbed at all as Kessler started the \$866,524 contract by widening the road. The design called for the two 12-foot concrete lanes, separated by a 6-foot bituminous median, to be converted into a roadway with two 24-foot lanes of plant mix, separated by a 4-foot reflectorized concrete divider.

Moving in with three LeTourneau 15-cubic-yard rubber-tire scrapers, the contractor began by cutting a ditch 18 inches deep and about 11 feet wide on either side of the existing road. Scrapers hauled the excavated material to fills in the area where part of the road was to be relocated. As soon as the ditches reached designed subgrade, the earth was compacted by Buffalo-Springfield 10-ton three-wheel rollers and a Huber 10-ton tandem roller.

The crushed slag making up the 6-inch special subbase was hauled about 10 miles from the H. K. Smith Co. quarry in Palmyra, Pa., by rear-dump trucks that used the existing road as a haul road. This base started on the eastbound lane, haul trucks coming off the road and entering the ditch via temporary earth ramps. Trucks then backed up to an Apsco stone spreader powered by a Le Roi engine, which spread the crushed slag at a uniform 6-inch depth across the width of the ditch. Buffalo-Springfield and Huber rollers compacted the course.

On top of the subbase, the contractor placed a 12-inch type-A base

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course, containing aggregate passing the No. 4 sieve, in two compacted 6-inch lifts. Both of these lifts were placed and compacted in a manner similar to that used on the subbase.

As soon as the eastbound lane had been completed, the contractor started work on the westbound lane. During this work, however, the trucks had to cross the westbound roadway, so the contractor had drivers use the 6-foot median to wait until aggregate was needed in the widening ditch. In this way, traffic using the eastbound roadway did not have to pass the trucks by pulling onto the 6-foot median that was not designed for travel.

Allis-Chalmers motor graders prepared the new shoulders and slopes before the surface course of 3-inch bituminous concrete was laid on each new lane by a Barber-Greene finisher.

#### Concrete on relocation

The 7,700 feet of roadway relocated to provide a straighter alignment consists of two 24-foot reinforced-concrete roadways, also separated by a 4-foot concrete divider. The 10-inch concrete slabs rest on 6 inches of compacted crushed slag containing particles ranging from 2 inches to dust. A total of about 137,000 cubic yards of excavation was handled by scrapers, Caterpillar D8 tractors, and Allis-Chalmers HD-19 and HD-20 tractors before paving got underway.

As soon as grading had been completed, about 2,100 feet of 10-inch Heltzel steel forms were brought to the site. Form stakes were driven by air hammers activated by a Schramm truck-mounted air compressor.

The first rig in the lineup was a Buckeye subgrader, powered by a Hercules engine, which rode the forms as it cut the subgrade to the desired elevation. Then a Buffalo-Springfield 10-ton tandem roller compacted the subgrade, and the final elevation was checked by scratch boards.

#### Joint forming

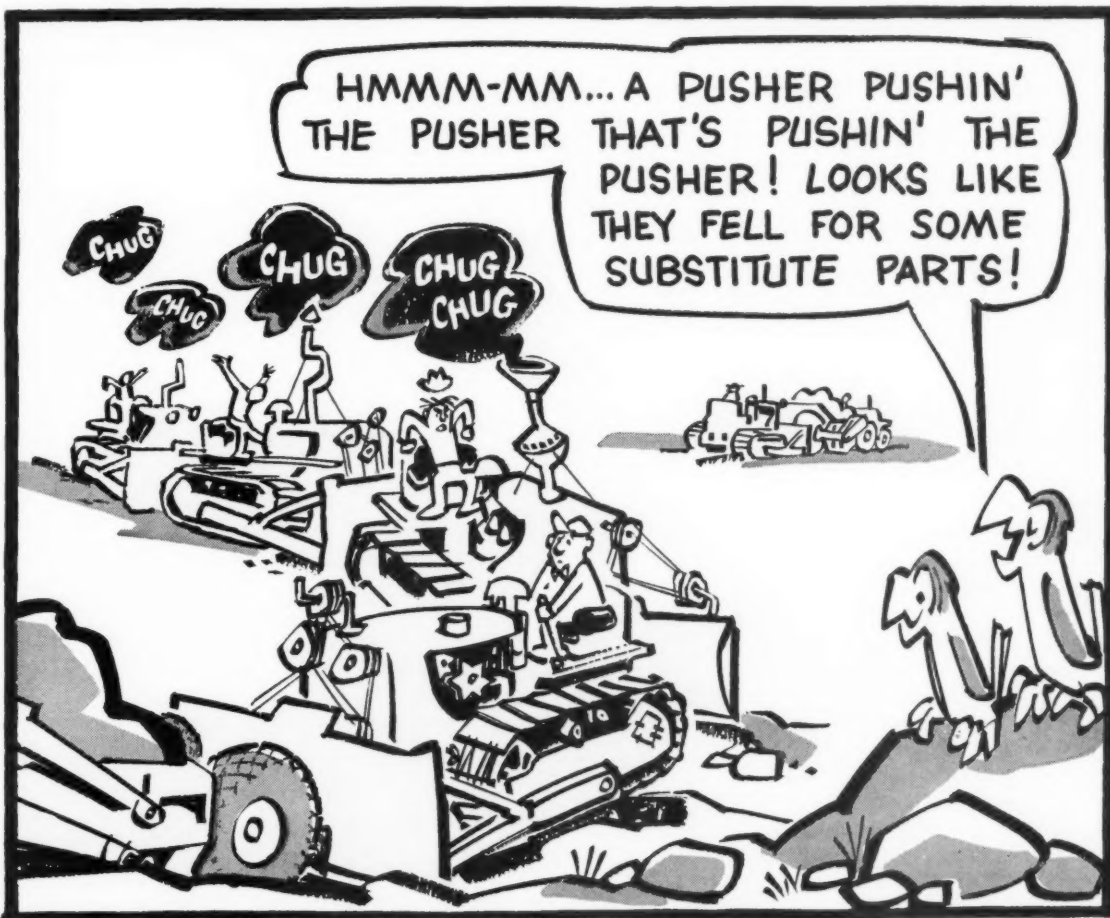
Contraction joints, formed on 62½-foot centers, were made with impregnated felt, held in place with wire chairs. Steel tie bars, ¾-inch in diameter, were placed on 1-foot centers across the 12-foot joints. A metal cap placed on the felt joint material made it possible for continuous paving to be done. The caps were removed before concrete attained initial set.

Forms were keyed to provide interlocking action with the adjacent slab, and dowels were used to provide additional bond between the slabs. The dowels were positioned so that the distance from one contraction joint to the first dowel was 18 inches, the distance to the second was 2 feet, and the distance to the third, 5 feet. The

(Concluded on next page)



As a Lorain crane with 60-foot boom and 1½-yard clam-shell charges the Butler 75-ton bin with sand and 1½ and 2½-inch stone, a Ford truck picks up a batch of aggregates. The truck then receives cement from the Butler 240-barrel silo, which is fed by a 40-foot elevator.



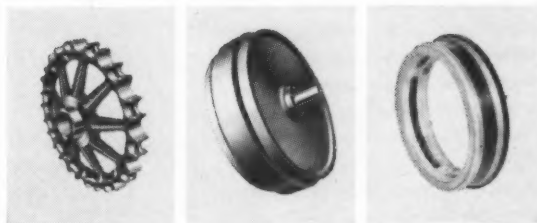
Anybody ever tell you there's no difference in parts?

Take sprockets, for example. Caterpillar *original* sprockets feature *deep-hardened teeth* with tough cores to withstand shock loads. CAT® *original* idlers have steel disc construction, with steel treads *flame-hardened* for greater wear. Cat bellows seals are of self-aligning face-type design. They help keep lubricant in and dirt out, even on the dustiest job. You're *sure* of new machine performance with original parts like these.

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**Better see your Caterpillar Dealer's Parts Representative—and get Cat original parts every time.**

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Caterpillar sprockets, idlers and seals are the result of over 50 years of track-type tractor manufacture. So don't be fooled—there is a difference in parts. Why take chances with substitutes?

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(Continued from preceding page)

remaining dowels were placed on 5-foot centers.

Just before the Koehring 34-E dual-drum paver came along, the subgrade was wet down. The paver rode on the outside of the forms, which were kept about 750 feet ahead of the concrete-placing operations. Equipped with a 35-foot boom and a double-gated air-operated bucket, the Koehring 34-E had a 1,000-gallon reserve water tank. During normal operation, water was supplied to the rig by a 2,000-gallon-capacity water tanker.

After every 1½-minute mixing cycle, the paver dumped a 37.4-cubic-foot batch to the grade, and the spreader moved ahead to cut the mix down, leveling it about 2 inches below the top of the forms. Reinforcing mesh was then placed on the fresh concrete, and the rigs moved back so that the paver could dump concrete on top of the mesh. The Blaw-Knox spreader then made a second pass to bring the concrete to a 10-inch depth.

After a Blaw-Knox double-screed transverse finisher smoothed out the surface, workmen finished the concrete with aluminum hand lutes and a burlap drag that was mounted on rollers riding the forms.

Sisalcraft paper was placed over the concrete about 1½ hours after a pour and remained there for 72 hours, even though forms were stripped after 24 hours and moved ahead by truck.

#### Batch setup

Concrete for the relocated road was supplied by the contractor's batch plant, located approximately a mile away from the new site. The plant consisted of a Butler 240-barrel cement silo, located adjacent to a Reading Railroad siding, and a Butler 75-ton aggregate bin having three compartments. Six stockpiles were maintained around the aggregate bin—two for sand, two for 1½-inch stone, and two for 2½-inch stone. Two stockpiles were maintained for each type of aggregate so that the moisture content in the material could be better controlled. Sand and stone could not be used for at least 18 hours after delivery. The bin was charged and the stockpiles were maintained by two Lorain cranes, one with a 50-foot boom and a ¾-yard clamshell, the other with a 60-foot boom and a 1½-yard clamshell.

Aggregates were delivered by truck, while the bulk Lehigh portland cement was brought up in bottom-dump rail cars. These emptied over a screw conveyor feeding an enclosed elevator that raised the cement 40 feet into the 240-barrel silo.

The seven Ford trucks that delivered batches to the paver were first loaded with 1,548 pounds of sand—this included the weight of the moisture—1,428 pounds of 1½-inch stone, and 1,418 pounds of 2½-inch stone per batch. After receiving the aggregates, the trucks drove to the cement silo and backed under it to receive 799 pounds of cement.

M. C. Monn was superintendent for

F. D. Kessler, Inc., and A. E. Dunford was the resident engineer for the Pennsylvania Department of Highways.

THE END

### Book covers diesel engine fuel-injection systems

A third edition of "Fuel Injection Systems", which covers systems introduced since the publication of the second edition in 1950 and expanded coverage of other systems, has been published by Diesel Publications, Inc.

Eleven injection systems commonly used are described and illustrated in the pocket-size paper-bound book. One chapter is devoted to modern servicing techniques and the tooling required. Another deals with features of special injection pumps for dual-

fuel engines. Nozzle test data is provided in tabular form. Separate chapters deal with equipment made by American Bosch, Bendix-Scintilla, Caterpillar, C.A.V. Ltd., Cooper-Besemer, Cummins, Fairbanks-Morse, General Motors, International Harvester, RoosaMaster, and Sheppard.

Copies of the 220-page book are priced at \$2 each. They may be ordered from Diesel Publications, Inc., 80 Lincoln Ave., Stamford, Conn.

### B-L-H elects board member

The Baldwin-Lima-Hamilton Corp., Philadelphia, Pa., has elected Louis Fenn Sperry to the firm's board of directors. Sperry is also the vice president of the First National City Bank of New York.

### Asphalt Institute manual treats mix-design methods

Information and instruction on the design of mixes is treated in a new handbook from the Asphalt Institute. "Mix Design Methods for Hot-Mix Asphalt Paving", (Manual Series No. 2), covers the Marshall, Hveem, Hubbard-Field, and Smith Triaxial test methods and gives interpretation and test data for each.

Photographs, charts, and diagrams illustrate the 168-page pocket-sized text. Appendices include information on gradation analysis of aggregates and the density and voids analysis of compacted paving mixtures.

Priced at \$1, the manual may be obtained from the Asphalt Institute, College Park, Md.

## How contractors benefit by TEXACO SIMPLIFIED LUBRICATION PLAN

**HERE'S ONE EXAMPLE.** All equipment used in the construction of Hungry Horse Dam, Montana, was 100 per cent Texaco-lubricated. The contractor wrote:

"The time and confusion saved by the Texaco Simplified Lubrication Plan are incalculable. Not only is it more economical to use a small number of lubricants, but there is little chance of error in application... a big factor in keeping our equipment on the job and our maintenance costs low."

The Texaco Simplified Lubrication Plan is adaptable to all types of heavy construction jobs and working conditions. The lubricants recommended may vary, but the object is always to confine all major lubrication to no more than six products. For example:

**1. ENGINE LUBRICATION:** Use one of the famous *Texaco Ursa Oils*—especially designed to make diesel and heavy duty gasoline engines deliver more power with less fuel and fewer overhauls.

**2. CHASSIS LUBRICATION:** Use *Texaco Marjak*. It won't jar or squeeze out, gives

longer lasting protection against dirt, wear and rust.

**3. WHEEL BEARING LUBRICATION:** Use *Texaco Marjak Heavy Duty*. It seals out dirt and moisture, seals itself in—assuring safer braking, longer bearing life. No seasonal change required.

**4. CRAWLER TRACK LUBRICATION:** Use *Texaco Track Roll Lubricant*. It gives effective, lasting protection against dirt, water and wear.

**5. AIR COMPRESSOR LUBRICATION:** Use *Texaco Regal Oil R&O*. It keeps systems clean and efficient. Also ideal hydraulic fluid—prevents rust, sludge and foam.

**6. ROCK DRILL LUBRICATION:** Use *Texaco Rock Drill Lubricant EP*. It protects against wear... prevents rust whether drills are running or idle.

Enjoy the benefits of the Texaco Simplified Lubrication Plan on your next project. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

★ ★ ★

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

**Hungry Horse Dam and Power Plant, Hungry Horse, Montana.** Dam is 564 feet high, 2,115 feet long at the crest and contains more than 3,000,000 cu. yds. of concrete. Four generator units have a combined capacity of 285,000 kilowatts. Texaco Simplified Lubrication Plan aided on-schedule completion.



# TEXACO

CONTRACTORS AND ENGINEERS



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**July 18-20 New York State County Highway Superintendents Association**  
Meeting, Statler Hotel, Buffalo, N. Y.  
Harry R. Mason, secretary, NYSCHSA, Fonda, N. Y.

**July 19 American Association of State Highway Officials**  
Meeting, Executive Committee, Fairmont Hotel, San Francisco, Calif. A. E. Johnson, executive secretary, AASHO, 917 National Press Bldg., Washington, D. C.

**July 22-25 National Association of County Officials**  
Twentieth Annual Conference, Hotel Utah, Salt Lake City, Utah. Keith L. Seegmiller, executive secretary, the NACO, 1616 Eye St. N. W., Washington 6, D. C.

**August 11-12 Seabee Veterans of America**  
Meeting, Hotel Sinton, Cincinnati, Ohio. J. Bert Knille, past national president, SVA, 1214 Sliker Ave., Cincinnati, Ohio.

## Convention calendar

### August 20-24 National Shade Tree Conference

Meeting, Royal York Hotel, Toronto, Canada. L. C. Chadwick, secretary-treasurer, Department of Horticulture, Ohio State University, Columbus, Ohio.

### September 5-7 Virginia Highway Conference

Meeting, Hotel Roanoke, Roanoke, Va. R. P. Ellison executive assistant, VHC, 1221 E. Broad St., Richmond, Va.

### September 16-22 American Society for Testing Materials

Second Pacific Area National Meeting and Apparatus Exhibit, Hotel Statler, Los Angeles, Calif. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia, Pa.

### September 23-26 American Public Works Association

Meeting, Will Rogers Memorial Auditorium, Coliseum, and Exhibit Building, Fort Worth, Texas. Donald F. Herriek, executive director, APWA, 1313 E. 60th St., Chicago, Ill.

### September 30-October 2 American Congress on Surveying and Mapping; American Society of Photogrammetry

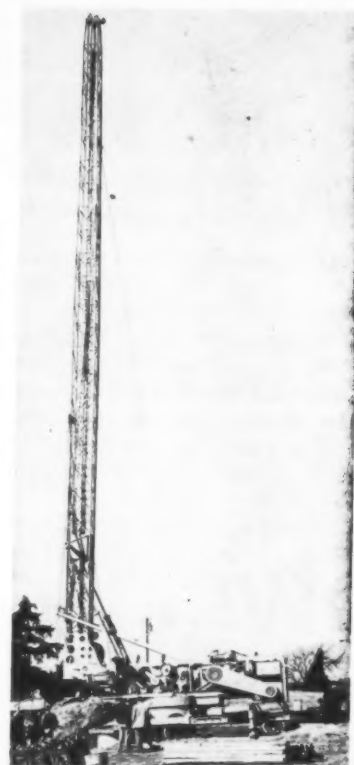
Meeting Shirley-Savoy Hotel, Denver, Colo. ACSM-ASP, Box 1407—Edgewater Branch, Denver, Colo.

### October 2-5 Short Course on Roadside Development

Fifteenth Annual Short Course on Roadside Development, Fort Hayes Hotel, Columbus, Ohio. Wilbur J. Garmhausen, chief landscape architect, Department of Highways, Columbus, Ohio.



BUREAU OF RECLAMATION PHOTO



Developed by the H. B. Williams Mfg. Co., this trailer-mounted earth auger is capable of digging a 9-foot-diameter hole 75 feet deep. The rig and its smaller companion model are undergoing U. S. Army Corps of Engineers tests at the Engineer Research & Development Laboratories, Fort Belvoir, Va.

### Two earth augers undergo Corps of Engineers tests

Two portable earth augers, developed by the H. B. Williams Mfg. Co. of Dallas, Texas, are undergoing tests at the Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va.

The larger of the units weighs approximately 50,000 pounds. Powered by a 192-hp gasoline engine, it is capable of digging holes up to 9 feet in diameter to a depth of 75 feet in many types of earth strata. Mounted on a standard military 25-ton low-bed trailer, the unit is 89 feet long in its traveling position. It features a turntable which permits digging and discharging of spoil on either side of the trailer.

A 5 1/4-inch square kelly bar with a 2-inch hole in the center makes possible the use of air, water, and Calyx drilling attachments. Augers, auger buckets for wet material, and core barrels for drilling in rock are standard attachments.

Digging operations have been successfully conducted in sandy loam, caliche, and decomposed granite. In sandy loam, the unit dug a huge hole at the rate of 6 inches per minute.

The unit's "kid brother", a 34-foot, 24,448-pounder which utilizes smaller versions of the same components, can dig holes up to 6 feet in diameter to a depth of 22 feet. Truck-mounted, it can dig at an angle, as well as vertically.

Developed primarily for use in construction of field fortifications and emplacements, as well as shallow wells, waste disposal pits, and other facilities, the augers are also expected to have application in the non-military construction field.

# Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 204

## Names in the news

### Army engineers transfer officials, name candidate

The U. S. Army Corps of Engineers has transferred George O. Evans from Fort Randall Dam, Pickstown, S. Dak., to Springfield, Mass. The director of construction at Fort Randall Dam on the Missouri River, Evans has been assigned to the post of area en-

ginner in charge of building ten flood-control dams and two local protection works on the tributaries of the Naugatuck and Connecticut Rivers.

Col. Milton P. Barschdorf, former assistant division engineer of the Lower Mississippi Valley Division and Secretary of the Mississippi River Commission, has been assigned as district engineer at Vicksburg, Miss. He succeeds Col. Thomas B. Simpson, who has been assigned to the Army War College, Carlisle Barracks, Pa. During World War II, Col. Barschdorf served in Panama, North Africa, and Italy.

The corps also nominated Raymond



George O. Evans, who will direct the Corps of Engineers' flood-control projects in New England.

W. Sauer as its candidate for the second annual National Civil Service League Career Service Award. A technical assistant to the district engineer at Vicksburg, Sauer has been associated with the Corps of Engineers

since 1927. During World War II, he was awarded the Legion of Merit Medal for his service in supervising the planning, design, and construction of a \$200 million military construction program.

Col. Gerald P. McCarthy, now executive officer of the Engineer School, Fort Belvoir, Va., has been appointed district engineer at Tullahoma, Tenn. He succeeds Col. Lavonne E. Cox.

During World War II, Col. McCarthy served in Africa, Italy, England, France, and Germany. He has also served in Greenland, Labrador, and England as both executive officer and as commanding officer of the 928th Engineer Aviation Group.

### M-C&S elects Werner vice president of firm

Merritt-Chapman & Scott Corp., New York, N. Y., contractor, has elected G. G. Werner, Jr., a vice president of the firm's construction department. With more than 25 years' experience in the construction field as a consulting engineer, Werner has managed a wide variety of projects throughout the world.

Prior to joining M-C&S, he had served for two years as construction manager on the French Moroccan Air Bases project.

A former commander in the U. S. Navy Corps of Civil Engineers, Werner is a member of the American Society of Civil Engineers, The Society of American Military Engineers, and The Moles. He is a licensed engineer in the states of New York, Connecticut, Maryland, and Virginia, and is a registered engineer with the National Bureau of Engineering.

### NYU alumni present award to John J. White

The Alumni Meritorious Service Award granted annually by New York University "to honor one who through good deeds has served Alma Mater", has been presented to John J. White. A 1912 graduate of the NYU College of Engineering, White is principal associate and chief specifications engineer of Parsons, Brinckerhoff, Hall & Macdonald, New York, N. Y., engineers.

He has written contract documents for such major projects as the New York World's Fair, the New York Thruway, the New Jersey Turnpike, the Garden State Parkway in New Jersey, and the Sunshine State Parkway in Florida.

### Corbetta promotes four

Four administrative promotions have been made by Corbetta Construction Co., Inc., New York, N. Y., to fill needs created by the expanding activities of the company.

John A. Tantillo and James B. Lytle, construction superintendents, have been made assistant vice presidents of the firm. George R. Miller, office manager, has been named assistant treasurer and Mario Egidi, of the Chicago office, has been promoted to the post of assistant secretary.

—For more facts, circle No. 205

# NOW!... out of 40 years' experience in manufacturing Asphalt Plants...

**COMES A NEW**  
**3000-lb., 4000-lb., 5000-lb.**  
**BATCH CAPACITY PLANT**

*the Streamlined*  
**MADSEN**  
**HOT-ROD**

**The Industry's Most Modern**  
**High-Speed • High-Production**  
**Fast-Moving**  
**ASPHALT PLANT**



### MADSEN DOES IT AGAIN!

Drawing upon experience and knowledge gained over the years, MADSEN now offers the sensational MADSEN HOT ROD Model 391 Asphalt Plant!

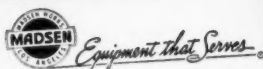
It's a versatile plant designed to handle the broad requirements of the contractor who likes to move as well as the contractor who wants to set up permanently. The HOT ROD boasts many new features (a few are listed at the left). It has a minimum of removable parts for transport, a good bin capacity, and a choice of screen and mixer sizes. It's a plant that's extremely simple to operate and easy to service. The 5000-lb. batch capacity HOT ROD shown above has produced in excess of 200 T.P.H. at a highly consistent rate.

Before you buy any asphalt plant... get all the facts on the all-new MADSEN HOT ROD. Contact your local MADSEN Distributor, ask for Catalog No. 391. MADSEN WORKS, 14120 E. ROSECRANS AVE., P. O. BOX 38, LA MIRADA, CALIFORNIA.

**MADSEN WORKS**  
CONSTRUCTION EQUIPMENT DIVISION  
BALDWIN - LIMA - HAMILTON  
DIVISIONS: Austin-Western • EddyStone •  
Electronics & Instrumentation • Hamilton •  
Lima • Loewy-Hydropress • Madsen • Pelton  
• Standard Steel Works



### Big New Features...



- New fully-enclosed gear box reduction unit that goes right into the mixer shafts!... eliminates exposed mixer timing gears.
- Famous MADSEN Twin-Shaft Pug Mill Mixer (Patented) with externally removable sectional liners, improved mixing action and faster discharge.
- Simplest, cleanest design in the industry... with a minimum of removable parts for easy transport and fast set up.
- Exclusive bin design (Patent Pending) eliminates segregation.
- MADSEN Asphalt Pressure Injection System (Patented) with new rotating distribution bar... injects the asphalt into the mill quickly — cuts it off sharply — to give you improved mixing and reduced mixing time.
- Fast air operation of bin gates, asphalt pressure injection and mixer gate.
- Operator's station on end of plant... with swivel-head asphalt and aggregate scales and all controls conveniently located for easy, fatigue-lessening plant operation.

ASPHALT PAVING PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS  
ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS  
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS



## ASCE metropolitan group elects new president

The Metropolitan Section of the American Society of Civil Engineers has elected David G. Baillie, Jr., to the office of president. He succeeds Richard Hazen.

Baillie is a partner in the consulting engineering firm of Singstad & Baillie, New York, N. Y. Formerly as-



David G. Baillie, Jr., president-elect of the ASCE Metropolitan Section.

sociated with the New York Triborough Bridge and Tunnel Authority, he had also served as assistant engineer with the tunnel division of the New York City Board of Estimate.

Two other officers, Richard H. Tatlow, III, and Arthur J. Fox, Jr., were elected to serve as vice president and secretary, respectively. John M. Buckley, Robert H. Dodds, and Martin S. Kapp were named as directors of the group.

## W. A. Warrick joins firm of consulting engineers

The former chief construction engineer and the deputy secretary of the Pennsylvania Department of Highways, W. A. Warrick, has joined the firm of John Clarkeson, Consulting Engineer, Boston, Mass. He will serve as regional engineer in charge of the firm's work in New York, Connecticut, and Pennsylvania.

Associated with the Pennsylvania Department of Highways for more than 30 years, Warrick is a member of the American Association of State Highway Officials and the Middle Atlantic States Highway Officials Association. He has also served as co-chairman of the AASHO for the joint cooperative committee of the AASHO and the Associated General Contractors of America.

## New officer heads Navy's public works district

Capt. Jule C. Tate, USN, (CEC), has reported for duty as public works officer at the Eighth Naval District in New Orleans, La. He succeeds Capt. W. T. Eckberg, USN, (CEC), who has retired.

## Asphalt Institute names new district engineers

The Asphalt Institute, College Park, Md., has appointed Robert C. Briggs district engineer for New England. He succeeds Robert B. McKeagney, who has been made division engineer for the Atlantic Gulf region.

Briggs has also served with the U. S. Army Corps of Engineers, the Massachusetts Department of Public Works, the Vermont Highway Department, and with private engineering firms. A member of the Society of American

Military Engineers, he will make his headquarters in Boston, Mass.

Frank H. Gardner has been transferred from Albany, N. Y., to Atlanta, Ga., where he will serve as district engineer. He had been district engineer in Albany.

A registered professional engineer, Gardner is also a member of the Highway Research Board, the Association of Asphalt Paving Technologists, and the American Society of Civil Engineers.

## Rust Engineering elects new vice president

George I. Seybold has been elected a vice president of the Rust Engineering Co., Pittsburgh, Pa. He had been a vice president and assistant general

manager of the Chemical Construction Corp., New York, N. Y., prior to his present appointment.

Seybold had also been associated with Rust between 1948 and 1952 as

George I. Seybold, vice president of Rust Engineering Co.



project manager on several of the company's major contracts. He will make his headquarters in the firm's Pittsburgh offices.

## Highway Users group names officers, award winners

The National Highway Users Conference has elected William S. Richardson to the presidency of the organization. The president of the B. F. Goodrich Co., Akron, Ohio, Richardson succeeds Albert Bradley in the post.

Three other officers were re-elected. Arthur M. Hill and Herschel D. Newsum have been re-elected to serve as vice chairmen. Louis J. Taber was re-named secretary-treasurer.

At the same time the NHUC cited the highway departments of Illinois, Nebraska, Maryland, and Massachusetts for outstanding highway reports to the public.

# Announcing...

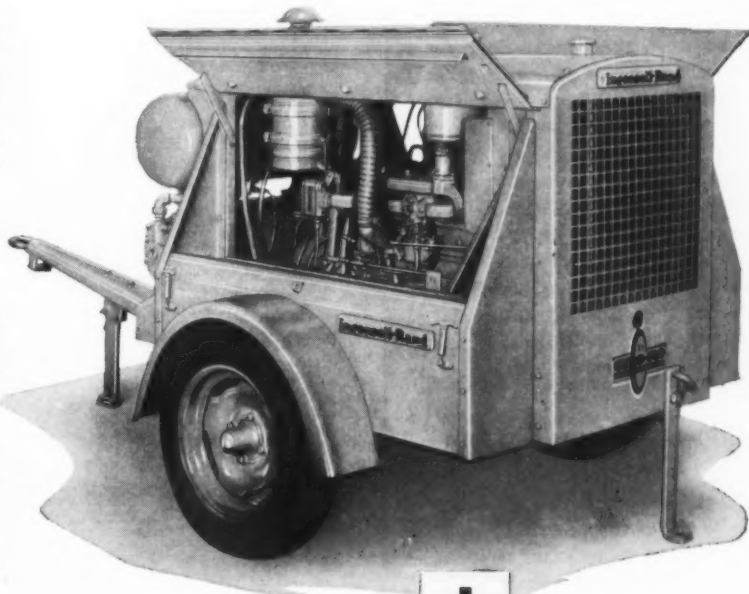
the amazing light-weight, compact  
**85 cfm GYRO-FLO**  
PORTABLE ROTARY COMPRESSOR

A new addition to the famous GYRO-FLO compressor line, this amazingly compact rotary delivers 85 cfm at 100 psi. It is by far the lightest portable compressor built in comparable capacity. Weighs only 1840 lbs—ready to go—fully equipped with tool boxes, fenders and two-wheeled spring-mounted running gear.

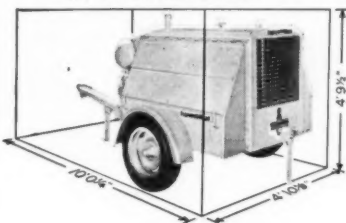
As a truck-mounted unit, the 85 GYRO-FLO weighs 1375 lbs and stands 42 in. high.

For your smaller jobs that need only 85 cfm of air power, this GYRO-FLO is certainly your best bet. It gives the same smooth, dependable, maintenance-free performance that characterizes GYRO-FLO compressors the world over.

With this new unit, the GYRO-FLO line now is increased to six sizes—85-125-210-315-600 and 900 cfm—the most complete line of portable rotary compressors available. See your Ingersoll-Rand representative for further details.



A LOT OF POWER  
IN A LITTLE SPACE



# Ingersoll-Rand

2-432 11 Broadway, New York 4, N. Y.

An unbeatable combination...  
GYRO-FLO Compressors and I-R Air Tools

Here's the complete line of GYRO-FLO heavy-duty portable compressors

... 6 SIZES



For more facts, use Reader-Reply Card opposite page 18 and circle No. 206





"Please, Mabel, if you want me to finish up early tonight, stay in the cab."

### BRI issues guide to building-science data

A comprehensive guide to the sources of information on research and technical developments in the building industry has been released by the Building Research Institute. Divided into two sections, with a third to be added at the end of each year, the "Building Science Directory" lists the names of organizations, societies, and associations that are sources of information. Universities conducting building research programs and private laboratories performing sponsored research work will be listed in future editions.

The second section details information about research programs, educational work, and standards and codes of each individual organization listed in section one. A brief description of each organization will also be given. At the end of each year, a complete index, covering both the first and second sections, will be issued.

Priced at \$2 for an annual subscription, the booklet is available from the Building Research Institute, National Academy of Sciences, National Research Council, 2101 Constitution Ave., Washington 25, D. C.

### Sonneborn Sons division opens two new plants

The Building Products Division of L. Sonneborn Sons, Inc., New York, N. Y., has opened two new manufacturing plants and warehouses, one in Chicago, Ill., and the other in Houston, Texas. In addition to its manufacturing activities, both plants will maintain extensive inventories of those products produced at the main plant of the division in Nutley, N. J.

David Frischer will head the Chicago office, which will serve eleven midwestern states. Five southwestern states will be covered by the Houston branch, under the management of Walter Kaye.

### Jackson elects director

Paul D. Kister has been elected to the board of directors of the Jackson Mfg. Co., Harrisburg, Pa., producer of wheelbarrows. He is the sales manager of the firm.

### Huge research center dedicated at Detroit

A \$100 million research and engineering facility devoted to technological advance has been dedicated just outside the city of Detroit by General Motors Corp.

The new GM Technical Center, which consists of 25 modern buildings on a beautifully landscaped 330-acre site, is the new headquarters for the firm's long-range styling, research, engineering, and process-development activities. More than 4,000 engineers, researchers, stylists, designers, mechanics, machinists, and other specialists work at the center.

Dedication ceremonies, attended by more than 5,000 leaders of industry, business, science, education, and gov-

ernment, were held May 16 on the Technical Center grounds and telecast by closed circuit to GM meetings held simultaneously in 61 cities throughout the country. Speakers included President Eisenhower on a closed circuit.

The Technical Center's landscape has a campus-like atmosphere. Its buildings, none higher than three stories, have clean, functional lines of contemporary architecture, utilizing structural steel framing that emphasizes large glass areas.

Construction of the huge facility began in 1949. Occupancy of the first building was in 1950 and last of the major operating units—styling—moved into its quarters late last year. Aero Saarinen & Associates, Bloomfield Hills, Mich., was the architect.



## more yards per load

### Gets More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back at ground level gets BIGGER LOADS with less spillage.

### Keeps More

Heaped loads are cradled closer and lower for greater stability while carrying. Hydraulic system shock-absorber also cushions the load, smooths the ride, and permits faster movement with less spillage.

### Delivers More

Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result—you deliver more yards per load and more loads per hour.

The new model HO is the finest four-wheel-drive tractor-shovel ever offered. It has *everything* that has proven desirable in modern tractor-shovel design, including important new and exclusive features: torque proportioning differentials; no-stop power-shift transmission; powerful 40-degree bucket break-out action; "stay-clean" hydraulic system; greater dumping height and reach; longer wheelbase; shorter length while carrying.

This big "PAYLOADER" operates easier and faster and rides smoother, with or without a load, than anything near its size. It has *balanced* design and durability throughout to turn out big production day after day. If you want proof of its *productive capacity* and superior *performance*, ask your "PAYLOADER" Distributor for a demonstration.

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A workman stops the action of the new McKiernan-Terry DE 30 diesel hammer by pulling a rope that disengages the fuel pump cam.

## New diesel pile hammer is self-contained unit

■ A new internal-combustion pile hammer, already widely tested in the field, has been unveiled by the McKiernan-Terry Corp. The new diesel-powered unit, self-sufficient in that it requires neither boilers nor air compressors, is more compact, lighter, more easily moved, and has greater versatility than steam-powered hammers.

The Model DE 30, which has a 3,000-pound ram capable of delivering 45 to 55 spm with an average force per blow of 18,000 foot-pounds, is the first in a series of three diesel hammers the company plans to manufacture. A heavier and a lighter model are scheduled for production in the

future, the company reports.

Simplicity of operation is a feature of the new Model DE 30. The hammer is worked by a single load line from a 30 to 35-ton crawler or truck crane. It is started when the ram is lifted by the load line from the crane and allowed to fall. Once started, the hammer operates at a speed and stroke determined by the pile resistance; the greater the resistance the longer the stroke and more powerful the blow.

During the down stroke the ram actuates a metering pump that delivers a measured amount of liquid fuel which falls into a pocket in the anvil block. When the ram strikes the anvil block the fuel is atomized by the impact blow and then ignited by the heat of compression of the air caused by the falling ram. The resultant explosive force drives the ram upward and the anvil downward, adding a pushing effect on the pile that combines with the impact blow given as a result of the ram striking the anvil.

During the upward travel of the ram, exhaust ports are opened to allow exhaust gases to escape. The hammer is stopped by pulling a rope (from the ground) which disengages the fuel pump cam.

The DE 30 design features a forced lubrication system that provides a continuous flow of lubricant to the wearing surfaces. In addition, high wear surfaces are plated with porous chrome for long life. The hammer operates on a minimum of fuel. Sufficient capacity for over three days of economical operation without refilling is provided by the 25-gallon fuel tank and 5-gallon lubricant tank.

An automatic trip mechanism engaged by the load line from the crane starts the hammer.

For further information write to the McKiernan-Terry Corp., 100 Richards Ave., Dover, N. J., or use the Request Card at page 18. Circle No. 161.

ER 2 1/4 cu. yd.

HO Lifting Cap. — 15,000 lbs. @ 0 mph  
Carrying Cap. — 7,500 lbs. @ 4 mph



d more loads per hour

## Loaded with "more-yardage" features

Torque proportioning differentials — an exclusive "PAY-LOADER" feature—increase effective traction. If one wheel begins to spin because of poor traction, more power is delivered automatically to the other wheel.

"No-stop" power-shift transmission, with torque-converter, can make ALL shifts on-the-go under full engine speed. There's no stopping for a range shift and no "clutching". Operator can "inch" the machine with forward-reverse control while maintaining full engine speed to provide maximum bucket lifting and dumping power.

All-power control also includes power brakes on all wheels, and power steer to further reduce operational fatigue and promote full production all day.

Rugged planetary final drives in all wheels, plus hypoid differential gearing keep torque low in axles—prolong life of drive train parts as well as axles.

## Safety and Stability

The safest and most stable wheeled tractor-shovel ever built. Moving members cannot injure operator because of underslung boom arm design and positioning. With loads carried lower and closer to the machine, cushioned during travel, and with longer wheel-base the utmost in stability is achieved.

### THE FRANK G. HOUGH CO.

762 Sunnyside Ave., Libertyville, Ill.

Send information on "PAYLOADER" tractor-shovels:

☐ model HO 2 1/4 cu. yd. heaped, 1 1/4 cu. yd. struck ☐ model HH 1 3/4 cu. yd. heaped, 1 1/4 cu. yd. struck ☐ model HU 1 cu. yd. heaped, 3/4 cu. yd. struck

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_



**PAYLOADER**

THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 207

## Film shows progress of work on The Dalles

A new sound-color motion picture showing progressive construction on The Dalles Dam on the Columbia River near Portland, Oreg., has been released by the U. S. Army Corps of Engineers.

Available only in the west, the film may be obtained from the film library of the Division Engineer, North Pacific Division, Corps of Engineers, 210 Custom House, Portland 9, Oreg.

## Slide-rule calculator

■ A pocket-size slide-rule calculator, offered without charge by Forney's Inc., instantly converts pressure applied to concrete cylinders and blocks into psi. Its range is to 175 tons covering 3×6 to 8×16-inch cylinders, and 13 standard-modular-size blocks.

To obtain this calculator write to Forney's Inc., Tester Division, P. O. Box 310, New Castle, Pa., giving company name and individual title, or use the Request Card at page 18. Circle No. 28.



## A highway department saves by spending

Arizona relies on training and modern equipment to economize with its engineering man-hours



**"We've overhauled our six-year-old No. 12 once—  
never done anything to our three-year-old grader"**

*Bud King, Missoula, Mont.*

Bud King is describing his CAT\* No. 12 Motor Graders, working on a 4.76-mile construction job of U. S. Highway 93 near Arlee, Mont. It is a remarkable tribute when you see the rough conditions in which these No. 12s work.

"I've been running big yellow equipment for 25 years," Bud King explains. "As far as graders are concerned, there isn't any that holds a candle to Caterpillar. We've overhauled our six-year-old No. 12 once—never done anything to our three-year-old grader but work it hard."

The No. 12 is trimming slopes of a new subgrade, most of it containing heavy rock. This is the type of rough going which shows the rugged characteristics of Cat Motor Graders to best advantage.

For under such conditions, it is doubly important that the unit is built by one manufacturer. That way, engine, blade capacity and working speed are carefully matched for sure-footed traction and high production. Here, too, it is important that the blades are made of high-strength alloy steels and cutting edges and bits of high-carbon steel. Here's where you appreciate having

the circle drawbar and blade supporting circle built of heavy box sections to withstand maximum loads.

And new tubeless tires are available at no extra cost, eliminating 80% of down time caused by tire trouble. They run cooler, last longer, give better puncture and blowout protection.

Have your dealer give you full details on this rough-and-ready motor grader. He'll tell you, for instance, about the exclusive new oil clutch which can operate up to 1500 hours without adjustment. But he'll do more than talk. He'll demonstrate—on your job. You name the date.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR\*

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**99% OF ALL CAT MOTOR  
GRADERS EVER BUILT  
ARE STILL ON THE JOB**

Getting more work done for less money is a big and tough problem that most highway departments face constantly. One way to make the problem of less concern, the Arizona State Highway Department is finding out, is to chip away at it, in every conceivable area where costs may be lowered and the efficiency of personnel increased. Working on this assumption, the department is saving money by spending it wisely.

Increasing the volume of work in place—and doing it at a minimum cost—depends largely on using new equipment to save engineering man-hours and training employees in the use of new machines and techniques. This is the opinion of William E. Willey who, after 23 years of service with the department, still remains one of the younger state highway engineers in the nation. He took over the job last year when the 1955 work season was half finished, and since then his ideas have begun to pay off.

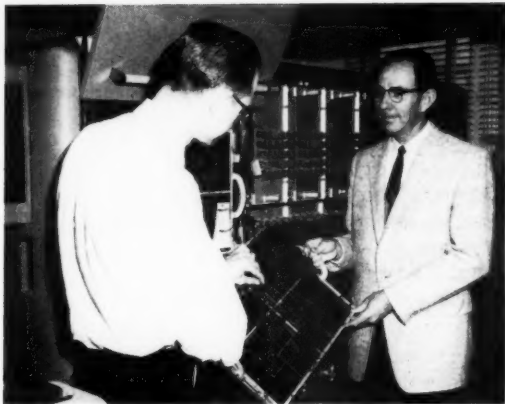
Already, there has been a marked increase in work under construction as compared with that done last year. In 1953, the best construction year in the Arizona State Highway Department, some \$16,970,000 was expended for contract highway construction. This fiscal year, \$18,000,000 is scheduled to be spent on construction. Work is actually far ahead of this schedule, despite the fact that the northern part of Arizona is not an all-weather construction area.

### Experienced for the job

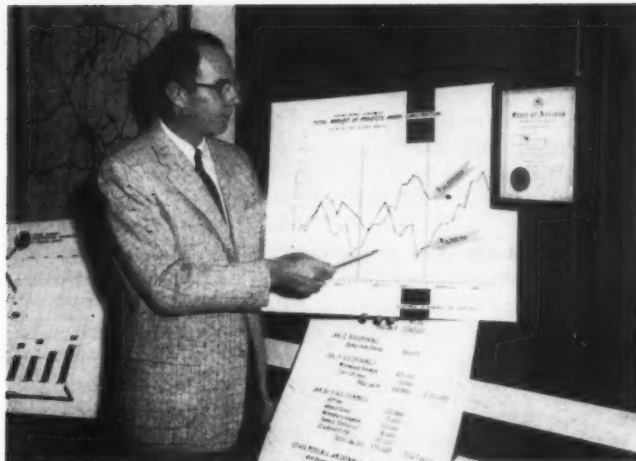
Willey's experience—both in and out of the department—made him the logical choice for state highway engineer when the department faced a crisis last year. For 6 years in World War II, he had served with the U. S. Air Force on technical engineering, planning, and the assembly of data. He had made a national reputation for himself as Arizona's engineer of economics and statistics. He was one of the first men in the nation to work on the development of a sufficiency rating system for the improvement of highways. Another study made by him dealt with the relation between horsepower in trucks and their efficiency in climbing steep mountain grades.

Then in the space of a year—1954 and 1955—state highway engineer R. C. Perkins died, and R. C. Canfield was killed in an automobile accident before he was able to fill the vacancy. George Lang, a long-time highway engineer, and district engineer on U. S. 66 at Flagstaff, served as state highway engineer until July 1, 1955, when he was named statewide maintenance engineer. When Willey took over at the start of the new fiscal year, his first act was to re-establish





William E. Willey, state highway engineer, looks on as Kenneth Phillips of the computing department prepares the Remington Rand Univac for an engineering problem. The state is one of the first to use the machine to relieve men for other work.



Willey's proficiency in assembling detailed information and presenting it in graphic form, shows up in valuable charts like these, which go to state highway commissioners.

monthly staff meetings for heads of all departments. Such meetings, once in force, had fallen into disuse during the postwar highway-building rush. From the start, these staff meetings proved valuable in stepping up the department's program and getting jobs under contract.

#### Employee training

At the same time, Willey used every persuasive device he could command to institute a comprehensive program of employee training. By last November, only 3½ months from the date of his appointment, a short college course in personnel management was conducted in Phoenix for all officials. Lectures by recognized authorities impressed on division officials the importance of picking the right men for various jobs and just how men should be selected. Such things as means of developing an employee's efficiency were included in the lectures, so that every division head was brought up to date with 1956 personnel-management problems and ideas.

Another part of the employee training program—the first annual conference of the Highway Department's Location Division—was held January 17 and 18 of this year in Phoenix. This meeting was aimed at bringing up to date and standardizing surveying and location practices in the department.

At the conference, John C. Park, dean of the college of engineering of the University of Arizona, discussed the theory of highway location, and R. E. Lawrence, chief location engineer, spoke about highway location in the past and at the present time.

Other subjects discussed were the importance of obtaining complete and accurate drainage information on location surveys, personnel administration as an aid in job security, functions of the U. S. Bureau of Public Roads, the development and improvement of Arizona State Highway system, traffic safety, and photogrammetry as related to ground surveys. The conference also tackled such things as how surveys tie with traffic, economics and statistics, materials, the Plans Division, bridges, the Computing Division, right-of-way problems, Contracts and Specifications Division business, and equipment.

High on the agenda was a detailed discussion of an idea that will revolutionize highway location.

(Concluded on next page)

**A  
GOOD  
Machine  
Made  
BETTER**

**...THE 3/4 YARD  
LORAIN  
25A**



Now we call it the "25A" and it really is "Grade A" with its many new, profit-making improvements. It is even better than ever. A general-purpose ¾-yd. machine that is easily converted to shovel, crane, clamshell, dragline or hoe.

Read below some of the features this newest Lorain brings you. If you are interested especially in dragline or hoe work, read the many additional advantages at the right the new Lorain-25A has for you.

The swing clutches have been increased 20% in area for cooler, smoother clutch action and longer life—especially important for the constant wig-wag operation of dragline duty. New, smooth, easy Lorain "E-Z" controls on friction clutches. "Hydra-Ease" power control of crawler steering, tread lock, house lock and shifting of swing-travel jaw clutches. Hydraulic Coupling Power Take-off available with no-stall, no-shock, "never-say-die" application of power.

These are but a few of the important features that put the new Lorain-25A a step ahead in the general-purpose ¾-yd. class. There are many more—you should learn about all of them from your Thew-Lorain Distributor.

THE THEW SHOVEL CO., LORAIN, OHIO, U.S.A.

**THEW  
LORAIN**

#### NEW DRAGLINE FEATURES

- New bucket boom. Square-tubular-chord design. Lighter, stronger. Can use longer, lower booms. Increased operating ranges. Can work with bucket farther out.
- New fairlead. Swivel type. All 4 sheaves mounted on pre-lubricated, sealed, anti-friction bearings.
- New, free-spinning action of drag-in drum. Permits quicker release of drag-in cable for easier, smoother bucket casting—greater ranges.
- New, removable shell lagging of steel permits heavier, stronger drag-in cable for longer cable life, fewer shut-downs for cable replacement.



#### NEW HOE FEATURES

- New, longer 19-ft. boom available. Digs deeper. Increases work ranges. Tapered, gooseneck design for greater ranges, better operator visibility.
- Greater choice of cutting widths. 30", 36" and 40"
- New, removable shell lagging of steel permits heavier, stronger, drag-in cable for longer cable life, fewer shut-downs for cable replacement.
- New, heavier hoe front end. Can handle even the toughest digging. Crowds better into the hardest of materials.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 209

## management

tionize location survey notebooks. The plan is to standardize on note-taking so that survey problems can be solved rapidly by the Remington-Rand Univac.

The Arizona Highway Department Univac machine—the first in a highway department west of the Mississippi River—was delivered in November and has already done some remarkable work. One triangulation problem, which an engineer estimated would take six hours to compute, was set up, run, and checked on Univac in one hour. The machine is being used on bridge design computations, triangulation problems, the calculation

of yardage for bids and estimates, and a number of other purposes. It stores and classifies information on personnel. It has freed many men for work on other phases of highway engineering. The Univac even makes a complete payroll for 1,800 employees, calculating the amount of Social Security, retirement, Blue Cross, and other deductions, completing the job without a single error in 20 minutes.

By bringing all the engineers to Phoenix for the conference, and making them feel that they were a vital part of the highway-building team, Willey was able to give them all a good knowledge of a new, complex technological innovation.

He did the same thing for every maintenance foreman and every key maintenance employee in the depart-

ment during the comprehensive two-day seminar in Phoenix. At this meeting, representatives from the Asphalt Institute showed the best maintenance practices in use. Willey is attempting to develop maintenance practices that will contribute to overall efficiency and generate public respect for these specialists in the department.

### Stress public relations

Public relations has come in for more than the usual share of attention this year. Before that time, if one of Arizona's five commissioners was interested in a particular problem, engineers were usually too busy to supply them with information. Today, a programming system is in effect which keeps any commissioner or dis-

trict engineer informed of just when any job will come up for contract. The program is set up about a year in advance, and commissioners are now supplied with a report showing exactly when a job will be done.

The public relations program is carried right down to field level. Location surveyors have been asked to let people know about work being done in a neighborhood. The surveyors have orders to let the Board of County Supervisors know about work that is going on. And when they move to a new site, they must tell city officials their business and, when possible, furnish newspaper editors with an account of work to be done.

The idea is to give the public a feeling that highways are everybody's concern, that engineering is being done for the benefit of everyone. Willey intends to keep on letting people know about the progress of work handled by the department.

### New headquarters

The new high in efficiency, which the department is reaching for, might be symbolized by the new administration building. It will have over 25 per cent more space than the present building, located just across the street from the new site. As soon as the building is finished, the Department of Motor Vehicles will take over the old headquarters building.

Right now, the big job for the department is reorganizing procedures for the most economical production of work. For Willey, the amount of construction that can be placed under contract in these times when highways are so badly needed is a good indication of the efficiency of the department.

The current \$18 million construction schedule represents an all-time high for the department, but Willey believes that the figure will go much higher when a comprehensive national highway building program is developed.

Meanwhile, Willey and his men are working so that the maximum amount of highway construction will be done for the minimum cost. He hopes to do it this way:

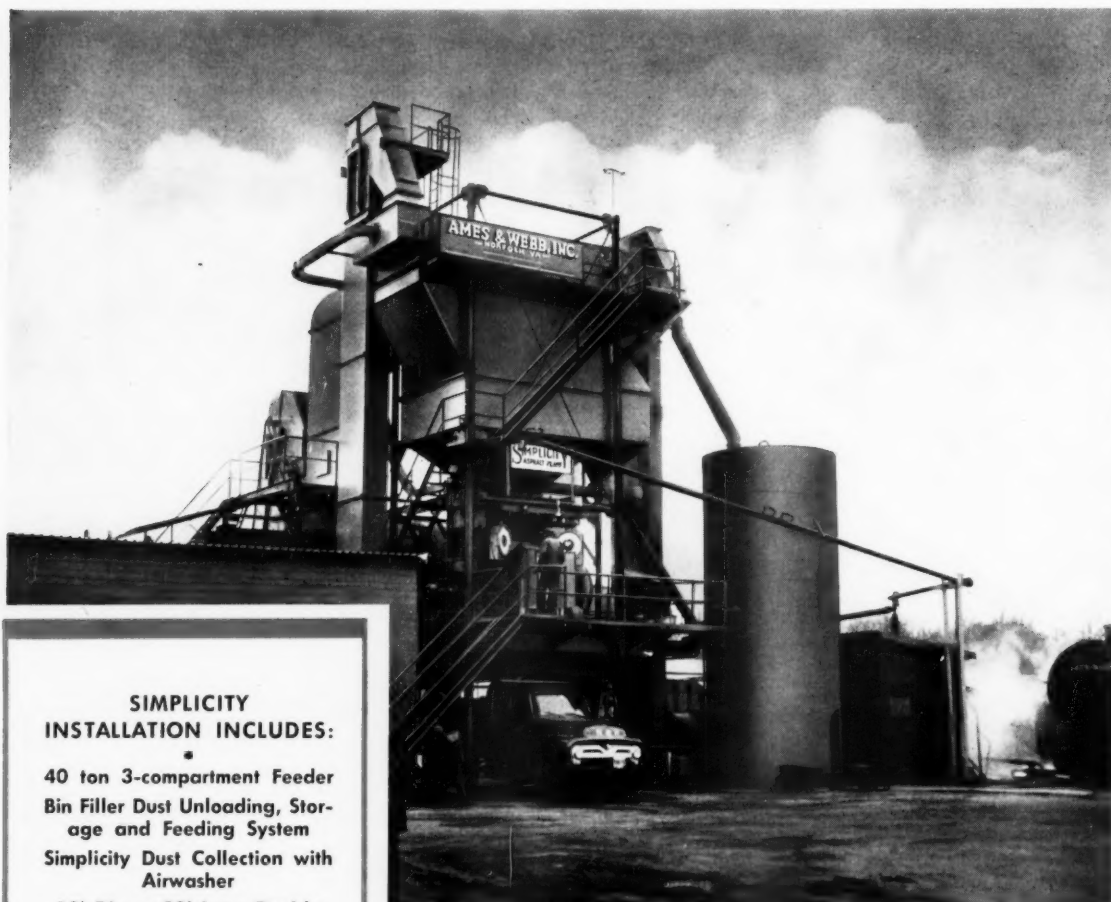
"If I have 500 headquarters people", he explains, "able to plan and program \$10,000,000 worth of construction each year, and these same people are able to plan and program twice that much if better work methods and new equipment are introduced, then the efficiency that results is worth the investment in training and machinery."

By being aware of and using new equipment and developments in highway building, Willey hopes to be ready for work to be done under a big national highway program. Meanwhile, his men are improving their production day by day on new state work.

THE END

### Albert Kahn elects

G. S. Whittaker has been elected to the board of directors of Albert Kahn Associated Architects & Engineers, Inc., Detroit, Mich. He takes the place formerly held by the late O. L. Canfield.



Another Simplicity Model S-100 Asphalt Plant Owned and Operated by Ames & Webb, Inc., Norfolk, Virginia

### SIMPLICITY INSTALLATION INCLUDES:

- 40 ton 3-compartment Feeder Bin Filler Dust Unloading, Storage and Feeding System
- Simplicity Dust Collection with Airwasher

- 10' Dia. x 20' Long Double Shell Simplicity Dryer
- Individual Electric Motor Drives and

OPTIONAL: MANUAL OR FULLY AUTOMATIC WEIGHING, BATCHING AND MIXING.

**ALL** asphalt plant manufacturers have made improvements during the past few years. With a big volume of work ahead, now is a good time to look around and see the latest that every asphalt plant manufacturer can offer. We all think we have the best. You be the judge.

**THE SIMPLICITY  
SYSTEM**

FROM BUILDER TO BUYER  
BETWEEN MEN WHO KNOW

**THERE'S A SIMPLICITY PLANT  
NEAR YOU**

On request, we'll be glad to send you the name and location of a nearby installation.

**DEPENDABLE**

**THE SIMPLICITY SYSTEM COMPANY**

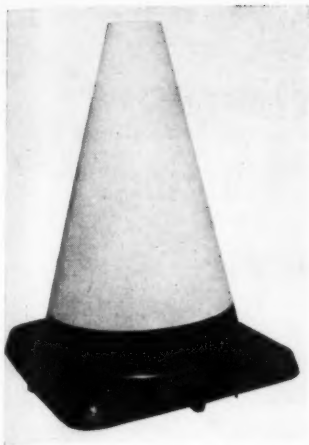
RIVERSIDE DRIVE

PHONE 2-2144

CHATTANOOGA 6, TENNESSEE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 210





A 12-inch-high model of the Safe-T-Cone has been added to the Radiator Specialty Co. line.

### Smaller model added to traffic guide line

The Safe-T-Cone line of rubber traffic guides, manufactured by the Radiator Specialty Co., now includes a 12-inch-high model in addition to the 18 and 28-inch models. The base of the new unit measures 8½ inches square and is available either painted or reflectorized.

Designed to support rubber signs, flasher lights, flags, and lanterns, Safe-T-Cones are recommended for use during highway building, repair, repaving, or wherever traffic-control guides are required.

For further information, write to the Radiator Specialty Co., 1700-1900 Dowd Road, Charlotte 1, N. C., or use the Request Card at page 18. Circle No. 148.

### Barricade locks prevent theft of warning lights

The Neo-Flasher Model-A barricade is now available to contractors on a sales basis, according to the manufacturer. Heretofore, it has been obtainable only on a rental basis.

The Model-A is a painted all-metal barricade stenciled with the word "Caution." It is constructed to permit installation of Neo-Flasher warning lights with a locking mechanism that prevents theft.

Illumination for the warning lights is through gas vapor tubes which are



A locking mechanism on the Neo-Flasher Model-A barricade protects the attached warning lights from theft.

weatherproof and will last indefinitely, the manufacturer states.

For further information write to the Neo-Flasher Mfg. Co., 3210 Valhalla Drive, Burbank, Calif., or use the Request Card at page 18. Circle No. 81.

For more facts, circle No. 211→

### Caterpillar dedicates grader, tractor plant

The world's largest motor grader and wheel-type tractor plant was dedicated at Decatur, Ill., the latter part of May by the Caterpillar Tractor Co.

Built to accommodate the company's growing production of wheel-type tractors and motor graders, and to release facilities at the main plant, Peoria, Ill., for added output of crawler tractors and diesel engines, the new plant is situated on a 425-acre plot of land less than a mile northeast of Decatur.

The manufacturing building, 730,-

400 square feet in area, has an exterior of aluminum-painted corrugated steel sheathing. It is double-walled and equivalent to two stories high all along its 830-foot width and its 880-foot length. Two assembly lines extend nearly the entire length of the plant. Adjoining the front half of this building is a two-story brick administration building which provides 53,581 square feet of office space on two floors. This building houses plant offices, the medical section, and an auditorium seating 255 persons.

In addition to these main buildings, the plant site includes a bituminous-surfaced parking area for 1,150 cars,

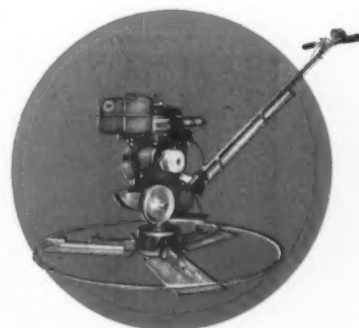
and 12 other buildings such as the heating plant, fixture-storage building, switch house, industrial waste disposal, and lumber storage buildings.

Employing more than 3,000 persons, the new plant is devoted to the manufacture of the No. 12, No. 112, and No. 212 motor graders and the DW15, DW20, and DW21 wheel-type tractors.

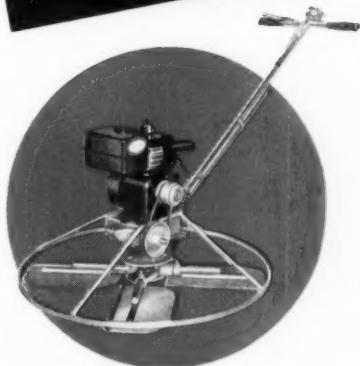
Ground was broken on the plant site February 22, 1954, and more than 100 prime contractors and subcontractors worked on the project. The first motor grader rolled off its assembly lines June 6, 1955, and first wheel tractor October 21, 1955.



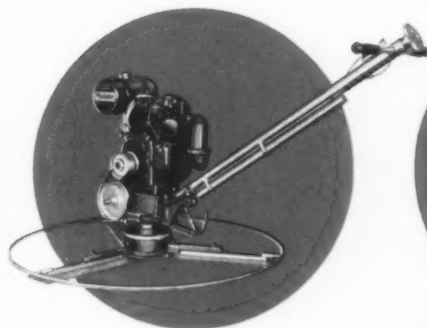
MODEL M — Small, compact for light construction. 29" dia. Combination trowels for floating and finishing.



MODEL J-1 — Medium machine for general use. 34" dia. Float trowels snap on in seconds. Largest selling model.



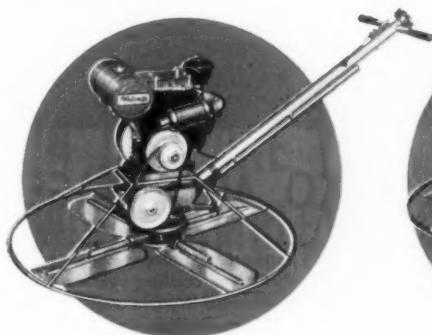
MODEL JA-4 — For average size jobs. Four trowel design. 34" dia. Combination floating-finishing trowels. Fixed ring.



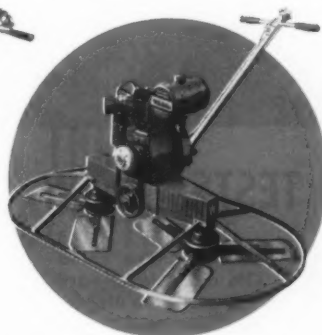
MODEL B-1 — Suitable for large areas. 44" dia. Snap-on float trowels. Rugged, dependable.



DISC FLOAT for dry mix and patented method slabs. Grinding attachments available.



MODEL C-4 — Large, heavy duty. 46" dia. Four combination trowels for floating or finishing. Fixed ring.



TWIN Finishes a full 5' width. Does the work of more than two machines. Combination floating-finishing trowels. Fixed ring.

Most models available with gas engines or electric motor drive.

### WHITEMAN TROWELS WEAR 4 TIMES LONGER

Made of especially engineered, extremely hard, durable tool steel, Whiteman trowels give 4 times the service of ordinary trowels—produce a smoother better slab. Insist on genuine Whiteman trowels!

**More Whiteman Finishing Machines are in use than all other makes combined!**

Only Whiteman builds a complete line of concrete finishing machines...each specifically designed for a particular need...each incorporating superior Whiteman engineering based on 16 years experience—plus the exclusive features and rugged construction that have made Whiteman the undisputed leader. Ask your Whiteman distributor to show you the model that is best for you.

### ROTATING OR FIXED RING?

During the past 16 years, Whiteman has made and thoroughly tested both rotating and stationary-ring machines and currently builds both types. Each has certain advantages and will finish equally close to walls, columns, etc. Consult your Whiteman dealer about the type best suited for your needs.

# Whiteman

THE LEADER  
IN CONCRETE  
EQUIPMENT



TRUCK MIXERS



POWER BUGGIES



VIBRATORS



SCREEDING MACHINES



FLOATING-FINISHING MACHINES

WHITEMAN MANUFACTURING CO., DEPT. CE  
3249 Casitas Ave., Los Angeles 38, Calif.

Please send prices, catalogs and name of distributor for  
☐ Power Buggies ☐ Screeding Machines ☐ Vibrators  
☐ Floating-Finishing Machines ☐ Truck Mixers

Name \_\_\_\_\_  
 Firm \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_





Chicago Pneumatic drills with air compressors drill the holes in which the explosives will be placed. American Cyanamid Co., the dynamite supplier, also acted as advisor to the contractor on the job.



## COMPETITIVE TESTS SHOW EIMCO ADVANTAGES

Recent competitive tests have shown again the superiority of Eimco equipment.

Tests conducted in timber and foothill brush were made to determine dozer earth moving and fire line construction ability.

Over a five day period numerous runs were made by impartial crews and judges with experienced operators using an Eimco 105 and a conventional tractor both equipped with bulldozers.

When final results were computed,

the Eimco rated "Best" with 33% more dozer earth moving and 11% more fire line construction and the Eimco had also earned operator confidence because it was more stable, easier to operate and would back up 30% steeper grade (the usual method of getting out of trouble).

The features on the Eimco that contributed to its success in the test and outstanding performance under most difficult conditions were: front operator position, better visibility, rear engine mounting, better weight distribution, torque

converter, better location and protection of cooling system, better maneuverability (through independent track control) simple controls which eliminate clutch pedals, steering clutch levers, master clutch and manual gear shift lever.

Eimco tractors with bulldozer or excavator attachments are demonstrating their superiority of performance and economy of operation on highways, construction jobs, in mines and in numerous other applications. See the Eimco Tractor before you make any decision on new equipment.

**THE EIMCO CORPORATION**  
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa



For more facts, use Reader-Reply Card opposite page 18 and circle No. 212

## Public instruction eases job of blasting in populous area

Handling the labor, mechanics, and techniques of a blasting operation on the Connecticut Turnpike was the easiest part of the job for Lizza & Sons, Inc., Oyster Bay, N. Y. (See "One man positions, operates, and moves crawler track drills", C&E, June, 1956, pg. 30.) The real problem came in establishing good public relations in the heavily populated towns of Milford and Milford-Orange, where the blasting was to take place.

One section of the contract for the completion of the superhighway included a straightway about 500 feet from a retail glass and china shop. Then too, there were several dwellings and a heavily traveled main artery, the Boston Post Road, nearby. Realizing the importance of good public relations now that road building is moving closer to more heavily populated areas, Lizza adopted a fixed plan of pre-blasting public instruction.

After the exact location of the blasting was determined, Lizza's project superintendent, drill foreman, and blaster discussed procedures and worked out details with the technical service men of American Cyanamid Co., New York, N. Y., the dynamite supplier.

The length of contracts totaled 20,700 feet, and approximately 400,000 cubic yards of gray and red shale and trap rock had to be excavated. Chicago Pneumatic drills and compressors used 2½-inch bits to accommodate American AC-44 2×16 dynamite. A variety of patterns, spacings, burdens, and shot quantities was decided upon in order to meet the prevailing conditions and still maintain working schedules and control operating expenses.

### Public education

Accepting the advice of the service people on the pattern, amount of shot, timing, and other details, Lizza proceeded with the preparations. Representatives visited the public schools in the area and held conferences with supervisors and teachers, giving a simple but detailed explanation of high explosives. Actual dummy samples of detonating caps were left at the schools so that teachers could familiarize children with the products used. The dangers of playing with or detonating any lost or stolen caps were forcefully explained.

Next, they visited the local police authorities, and in addition to leaving samples of caps, they outlined a tentative explosion schedule. The locations of magazines and instructions on locating perpetual inventory sheets were given. Expected arrival dates, together with approximate times and

CONTRACTORS AND ENGINEERS

**Crews make pre-blasting visits to homes, schools, and shops, giving safety instructions on operation to local residents**



When this explosion occurred, residents in the vicinity were not disturbed. Control through the delay system of detonating caps caused stone to fall in the desired direction.

routes, were also recorded with the law-enforcement agencies.

About five days prior to the actual explosion date, local newspapers carried large display ads notifying the public that blasting was to take place. All persons were cautioned to avoid crossing or entering the right-of-way during the blasting operations and were courteously asked to respect all warning signs, barricades, and flag men. About two days before the blast, all inhabited structures within a quarter-mile radius were visited by a crew that explained to housewives and shopkeepers what to expect at the time of the explosion.

All persons visited were especially appreciative; many had questions that were answered with non-technical information that put their minds at ease and made for a friend-



One of the Lizza men wires a circuit for detonation.

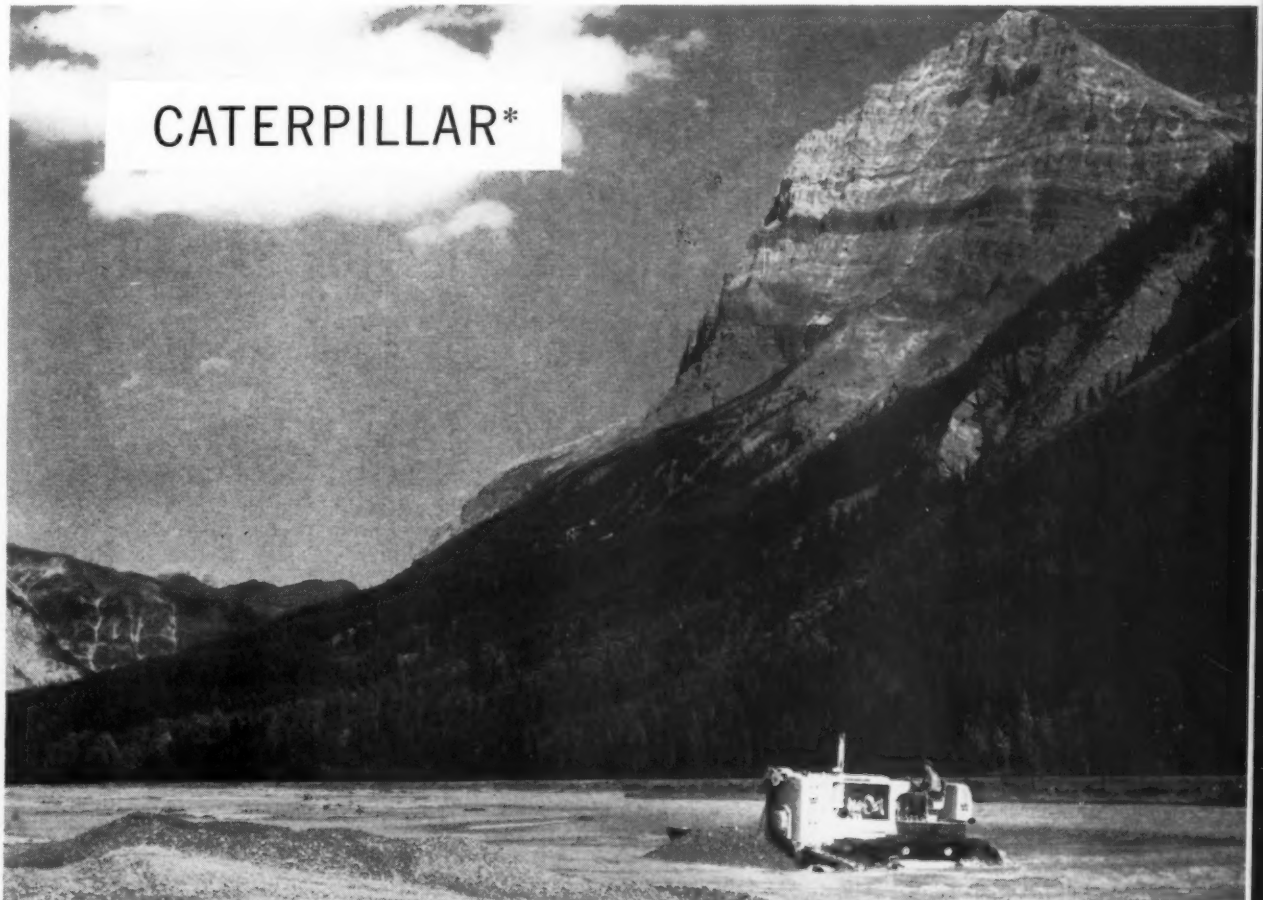
lier, more sympathetic relationship.

The owner of the china and glass shop was naturally concerned about his merchandise. Thousands of pieces of expensive and fragile glass and china were piled precariously high on display shelves and counter tops. To remove his wares to solid ground would entail long hours of work and expense. These factors had been taken into consideration when the technical service men of American Cyanamid made their recommendations for shot load and pattern detail, and as a result, Lizza could give assurance to the owner that blasting would not damage his displays of merchandise.

The manager of the restaurant was primarily concerned with his customers. Should he inform them of the blast to take place, or should he adopt a "business-as-usual" attitude? He was told that there was no cause for alarm and that the patrons, in all

(Concluded on next page, col. 3)

Advertisement



IN BRITISH COLUMBIA, a D9 builds a dike to keep water from a borrow pit where it is push-loading DW21s on the Trans-Canada Highway construction. The owner, General

Construction Co., Limited, Vancouver, reports, "This D9 push-loads 225 DW21s and Scrapers per day with river-run gravel." The D9 is equipped with a No. 9A Bulldozer.

## IN JUST ONE YEAR, THE D9 WINS COMPLETE ACCEPTANCE

*Across the continent, contractors make it standard equipment on tough jobs*

Just one year after its introduction, the Caterpillar D9 Tractor—the biggest yellow machine of them all—is standard equipment in the construction industry. From British Columbia to Florida . . . from Massachusetts to California . . . on every conceivable type of job . . . enthusiastic reports roll in from satisfied contractors who have bought it. The exclusive Turbocharged engine of this Caterpillar giant is making the dirt fly on highway construction and relocation, on land clearing projects, dam and canal jobs, and at large building developments. Reports Minnesota contractor George W. Johnson, "Here is packaged power that we, of the construction industry, never have been offered before." Whatever the reason for this universal enthusiasm . . . power, ease of operation, simplicity of maintenance . . . one fact stands out. Never before has a piece of heavy equipment been accepted and put to use so quickly. *CONTINUED*

NEAR CHARLESTON, S. C., a D9 clears and 'dozes 150 acres in Bushy Park project to develop water sources on a \$4½ million industrial site development. Over 3 million yards will be moved by owner, Robert E. Lee & Co. of Manning.







Complete power steering and a steering wheel instead of a lever make the new Littleford Model 160 portable roller easy to maneuver.

### Portable roller features complete power steering

■ A new 3 to 5-ton portable roller with complete power steering is available from Littleford Bros., Inc. With the addition of the Model 160, the company now offers a complete line of portable rollers including 2 to 3-ton and 4 to 6-ton models.

Portability is accomplished with a pair of rubber-tire trailing wheels. The wheels are hydraulically lifted 5 inches above the rolling surface when the rig is in operation. They may be removed from the roller quickly and easily, the manufacturer points out.

The power steering is in operation at all times. The steering is done with a wheel, rather than a steering lever. The clutch is located outside, for easy adjustment. Powered by a 19.5-hp air-cooled engine, the Model 160 has two forward and two reverse speeds.

For further information write to Littleford Bros., Inc., 485 E. Pearl St., Cincinnati 2, Ohio, or use the Request Card at page 18. Circle No. 130.

### Blast-hole drill

■ The Ingersoll-Rand Drillmaster, for deep blast-hole drilling up to 6½ inches in diameter and to depths of 125 feet, is highlighted in a catalog from the manufacturer. Said to be useful for road contractors and construction men, the unit can be mounted on a crawler, a truck, or a tractor. A diagrammatic view of the Drillmaster points out the adjustable chain tension, tubular-steel cantilever tower, hydraulic system, Gyro-Flo rotary compressor, built-in lubricator, utility hoist, and dust collector hood. Job photos and brief details show the unit Truem or Tracm-mounted, that is, truck or tractor mounted.

To obtain Form 4179 write to the Ingersoll-Rand Co., Phillipsburg, N. J., or use the Request Card at page 18. Circle No. 138.

### Le Roi plans expansion

A \$5.5 million engineering and research expansion program has been undertaken by the Le Roi Division of Westinghouse Air Brake Co., Milwaukee, Wis., manufacturer of engines, air compressors, and rock drills. The expansion will be centered around the firm's main plant in Milwaukee.

As part of the program, the division has established a metallurgical section complete with laboratory facilities and has reorganized its quality-control department.

(Continued from preceding page)

probability, would never know an explosion had taken place.

With the completion of these steps toward better public acceptance, the first blast took place. The predictions of American Cyanamid were correct to a detail—noise was at a minimum; rumble and reverberation, unnoticeable; and debris, negligible.

Many subsequent blasts have taken place with the same desired measure of success.

Public reaction to the method of handling the explosions was enthusiastic. The restaurant manager ap-

preciated the concern and friendly advice of the contractor; the china-shop proprietor was amazed that not one piece of delicate glass moved when blasts went off. A housewife was grateful when she was advised not to hang out her wash until after the blast had taken place.

The favorable public reaction to the public relations program smoothed over some of the difficulties usually encountered in blasting near public and private property. Certainly, for Lizza, it helped ease the problems associated with blasting and speeded up his job.

THE END

Advertisement

## D9 ACCEPTED (continued)

# BIGGEST TRACTOR PASSES ITS TEST BY FIRE

The first year in the field is always the most crucial for new equipment. Performance is watched closely and weighed carefully by veteran contractors. Here the D9 passes its first birthday with flying colors on widely different jobs across the nation... in soil conditions that include sand, peat, yellow and blue clay, decomposed granite, boulders, shale and gravel.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

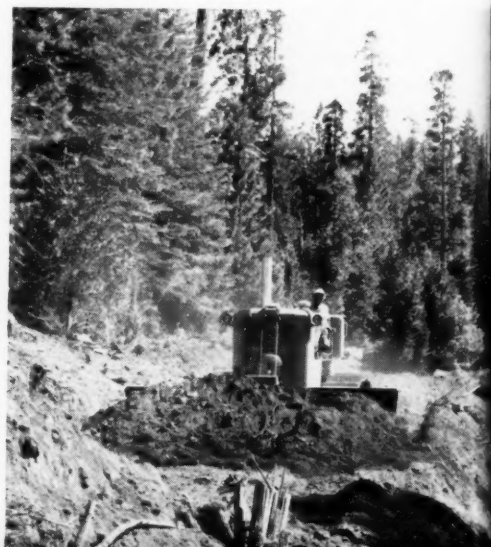


IN MONTANA, a D9 push-loads a No. 90 Scraper on a U.S. Highway 93 project for its owner, Bud King Construction Company, Missoula, Montana. The 31-cu.-yd. (heaped, with sideboards) No. 90, pulled by a D8, is working in a 150,000-cu.-yd. cut near Florence, Montana.

NEAR IDAHO CITY, a D9 pioneers sidecuts, widening and relocating a 11.37-mile section of highway for Morrison-Knudsen Co. In rock and sand, the D9 is making 40 passes an hour, 14 ft. wide, 200 ft. long.



IN STRAWBERRY, CALIF., a D9 builds a 4-mile access road to Beardsley Dam site. The owners, Tri-Dam Constructors of Strawberry, are roughing out this road in 60 days. Soil is decomposed granite and boulders.

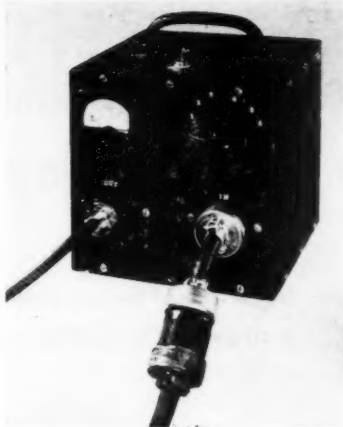


## New portable booster unit delivers greater voltage

■ A new portable electric power unit, the Portopower voltage booster, has been designed to deliver the additional voltage required so often in construction work where power tools are used.

The Portopower booster is equipped with a voltage meter for checking delivered operating power, and a five-position voltage-increase switch with each position providing a 10-volt step-up in voltage output (total increase available: 50 volts).

In the operation of a portable power



saw, the Portopower unit can be used to replace voltage lost through use of an extension cord. Under these same conditions, the voltage booster can also be used to step up operating speed of the power saw, reducing cutting time as much as 30 per cent.

The voltage output available with this unit is enough to operate three saws at one time. The booster will feed up to ten units on one hookup at 50 per cent duty cycle.

For further information write to the Portopower Division, 1511 E. Nine Mile Road, Ferndale 20, Mich., or use the Request Card at page 18. Circle No. 11.



Removal of several Panel Loc clamps frees the special panel and permits opening the cleanout or pouring pocket.

## Pour pockets installed in forms by new method

■ A new technique for providing clean-out and pouring pockets in its Uni-Form system has been announced by the Universal Form Clamp Co. Standard elements of the Uni-Form system are used, permitting uninterrupted tie placement and form erection.

To provide for the openings, a combination of standard Uni-Form panels and pouring pockets are used. Both are installed in the same manner. The pockets are locked to the panels by means of standard Panel Loc clamps.

For further information write to the Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 115.

## Transit-mix trucks

■ Two six-wheel transit-mix trucks are detailed in a folder from the White Motor Co. The Model WC 2264, mounted on a 32,000-pound tandem axle, carries 5 cubic yards of mix, according to the specifications, while the Model 302264 hauls 6 yards of mix, 175 gallons of water in the mixing drum, and 80 gallons of water in the flush tank. Job photos show other White trucks hauling bulk cement and concrete blocks.

To obtain this folder write to the White Motor Co., 872 E. 79th St., Cleveland 1, Ohio, or use the Request Card at page 18. Circle No. 36.

## Bar benders, cutter

■ Three models of reinforcing-bar benders and one cutter are described in a catalog from the importer, Albert Klingelhofer Machine Tools, Inc. The Simplex bar cutter and the Perfect bar bender are for 1¼ to 2¾-inch round reinforcing bars. Two units are pictured, one for small double bends and the other for large double bends. Also shown is an attachment for straightening and bending spiral, ring, and curved bars. Capacities and specifications of the units are included.

To obtain the catalog write to Albert Klingelhofer Machine Tools, Inc., 740 Colfax Ave., Kenilworth, N. J., or use the Request Card at page 18. Circle No. 52.

←For more facts, circle No. 213

Advertisement



PARAMUS, N. J., building a shopping center, a D9 'dozes pile and clay to help load scrapers quickly for Sam Braen

Construction Co., Wyckoff, N.J. After 'dozing, the D9 push-loads two CAT® DW21s in less than 60 seconds.

MINNESOTA, this D9 singlehandedly reduces this cut (10 ft. long by 150 ft. wide) to 8% grade for its owner, Hanson Construction Co., Grove City. The D9 handles

10 to 15 yards a pass on the cut involving 237,000 yd. of fine sand, blue and yellow clay. Job is relocation and widening of U.S. Highway 16.

access  
i-Dam  
is road  
uldres







The Back River dike begins to take shape in the swampy area that first had to be excavated before hydraulic fill could be pumped into place.

## Dredge closes river dike for huge water-development job

**Successful twelfth try with Cooper marl is made before tide turns; cost of project supplying 10 billion gallons daily is \$2,650,000**

by ANTHONY N. MAVROUDIS, field editor

Closing a river dike hydraulically is every dredge operator's dream. It rarely comes true, but it was realized by the dredge operator working on a project, which, in itself, is a dream come true for many South Carolinians.

This is the Bushy Park water development project, located a few miles northeast of Charleston, which was completed this month to supply a proposed industrial development with ten billion gallons of fresh water daily.

All this water is being provided by a project that cost \$2,650,000—a sum that other sections of the country might only dream of paying for similar work. The Incodel project, for instance, will add only 1½ billion gallons to the New York-New Jersey-Pennsylvania water supply, and it will cost about \$800 million. The reservoir currently under construction for Dallas, Texas, will cost \$20 million.

The low-cost Bushy Park project is even more of a bargain, considering that when Arthur M. Field, chief engineer for Charleston's Development Board, conceived of the project, the construction cost was prohibitive.

The plan was to make use of water flowing down the Cooper River into the Atlantic, via Charleston Harbor. This water comes from the upper Santee-Cooper Reservoir formed by the Santee Dam. A diversion canal leads water from this reservoir to the lower Santee-Cooper Reservoir formed by the Santee-Cooper Dam. The total capacity of both reservoirs is 800 billion gallons.

A hydroelectric plant, located at the lower reservoir, about 23 miles north of Bushy Park, discharges ten billion gallons of water daily through a tail-race canal and into the Santee-Cooper River that forms the eastern boundary of the proposed 4,400-acre industrial site.

The only difficulty was that water flowing in the Santee-Cooper River was contaminated by salt intrusion and useless to industry. Test samples showed that salt, helped along by high and storm tides, penetrated to a point almost north of the proposed industrial area.

The cost of constructing a network of locks and dams to keep out the salt would have been very high. And

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The big fleets keep complete cost records. They know which trucks cost less to buy and run. And official R. L. Polk registration figures prove FORD IS THE FAVORITE!

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The "men who buy trucks every year" take everything into consideration . . . Ford's stronger engine design for low oil and gas consumption . . . Ford's stronger chassis for longer life (insurance actuaries prove Ford trucks last longer) . . . and Ford's higher resale value. So—from Pickups to 65,000-lb. GCW Big JOBS, the big fleets are going Ford. They agree Ford Trucks cost less—when you see a Ford Dealer.

The hydraulic fill dam keeps salt out of Back River, which can carry 10 billion gallons of water daily from the upper and lower Santee-Cooper reservoirs for the industrial development. Industrial waste will be eliminated in the salt-contaminated Cooper River.

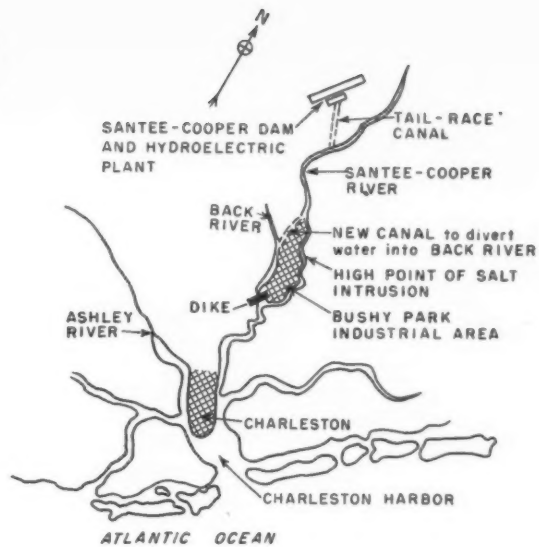
additional locks and dams would be required for shipping, since the industrial site needs a navigable channel leading to the 35-foot-deep Charleston Harbor.

#### Alternative plan

A solution to the problem was found by Arthur M. Field, who noticed on a flight over the area that the Back River, running parallel to the Santee-Cooper and forming the western

boundary of Bushy Park, joins the Santee-Cooper at the southern extremity of the industrial site.

Field figured that if a dike were thrown across the Back River, just above its junction with the Santee-Cooper, salt would not be able to penetrate into the river. At the same time, a canal cut from a point above the limit of salt penetration in the Santee-Cooper could lead water to the headwaters of the Back River.



This would make it possible for industry to get fresh water from Back River and discharge effluence into the navigable Santee-Cooper.

#### Two dredges do the job

Robert Lee, Inc., Manning, S. C., started operations under the \$2,650,000 contract in October, 1955, with a 16-inch and a 27-inch dredge. The smaller one was used to cut the four-mile-long canal through the marshy lowlands from the Santee-Cooper to the Back River. It removed more than 750,000 cubic yards of material as it cut the 100-foot-wide canal to an elevation of minus 10 feet.

The 5,700-foot long dike, located at the downstream end of Back River keeps salt from penetrating into the stream and will carry a railroad spur and highway from the mainland into Bushy Park. The 1,800,000 yards of hydraulic fill required for this dike was pumped up by the 27-inch dredge, Admiral, which did not make the final closure until the canal had been completed.

The dike could have been built first, but in this case equipment would have had to stand by at the canal plug so that the canal could have been opened if high water in Back River needed relief after the dike had been closed. Then too, if the canal had been kept closed and rains caused the river level to rise, it would have been impossible to close the dike. It was felt that if the canal were opened first, the additional flow of water in Back River would help counterbalance the water-level differential at high tide when closure was made.

The Admiral brought the dike to an elevation of about plus 14 feet, while a Caterpillar D7 tractor and a Cat No. 12 motor grader shaped the hydraulic fill. These rigs also shaped the 500,000 cubic yards of clayey-sand topsoil which was placed after the hydraulic fill was built up. The topsoil material varied from 1 to 5 feet in thickness on the fill, and it was obtained from a roadway excavation by four Caterpillar DW21 scrapers. These were push-loaded to capacity by a Cat D9 tractor. Compaction of the fill was handled by a sheepfoot roller pulled by a Cat D7.

Work continued until a gap 40 feet wide was left just off the west shore

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"Our 30 Fords are easiest handling," says Elmer C. Breuer, Cleveland steel hauler. "Maneuvering our Ford F-900's in tight spots is timesaving and easy. And with that Power Steering our drivers finish fresh after a tough day's work. We're staying with Ford because they give us fast, dependable service."

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The soft Cooper marl being pumped into the dike hardens like mortar when exposed to air and water and becomes almost erosion-proof. The material, easy to get at, eliminated the need for commercial fill and kept costs down.

of Back River. The velocity of water flowing through this opening increased gradually as the gap was reduced, until, when the opening was 40 feet wide and the dike at an elevation of about minus 3 feet, water was flowing through the gap at a rate of 15 to 20 knots.

The only time closure could be made was in a 1½-hour period at high tide. At low tide, the water differential on either side of the dike was 6 feet, the higher level being north of the dike. It was impossible to make the closure at this time because fill would have been washed out of the gap as fast as the material was placed.

During the 1½-hour period at high tide, the water level on the south side of the dike was about two feet higher than water on the opposite side, and was almost counterbalanced by water flowing down the Back River from the diversion canal.

The first attempt at closure was made when the gap was 40 feet wide and the fill at an elevation of minus 3 feet. Just as the header barge got the dredge discharge line in position on the south side of the dike, the tide began to change from high to low and rushing waters cut a gap in the dike 200 feet wide and to an elevation of minus 20 feet.

After the contractor had repaired the dike, a second try was made. This time, mechanical difficulties on the dredge prevented the closure. On the third try, the dredge operator hit unsuitable material, and by the time he could relocate the dredge the tide had changed. Eleven attempts had failed when the contractor felt that perhaps closure should be made with backfill material that was hauled in and dozed into the gap. This alternate method was beginning to look like the only solution to the problem, when the dredge made a twelfth try and closed the gap.

#### Marl makes for low cost

With the closing of the dike, the contractor was free to concentrate on the construction of a bridge across the canal. This bridge will replace the road which formerly led to the famous Cypress Gardens. Six miles of unpaved roadway, linking Bushy Park and the mainland are also included in the \$2,650,000 contract.

One of the factors which cuts construction costs on this project is also expected to keep costs down when industry begins building in Bushy Park. Fill material used for the dike consisted of Cooper marl which, unlike ordinary marls that disintegrate in water, is soft and easy to dig and acts like mortar when exposed to water and air. The surface of the marl case-hardens and becomes practically erosion proof when it is dredged from the river bottom and exposed to air. This marl did away with the need for commercial fill at the dike, and when industry starts constructing new facilities at the site, it will be able to bore tunnels through the Cooper marl without having to either line or support them.

If industry wants concrete proof of

this fact, Charleston can point to the aqueduct dug through Cooper marl from Charleston to the Edisto River, 22 miles away, in 1936. About 10 or 12 years after construction, the aqueduct was drained for inspection purposes, and so little erosion had taken place that original boring marks were still clearly visible along the tunnel walls.

#### Future bright

Construction of the Bushy Park water-development project, which assures Charleston of an ample supply of fresh water for all possible future needs, and industry with enough fresh water to meet all its needs, got under way in 1953, when the South Carolina general assembly created an eight-member authority to administer



#### WEIGHT OF TYPICAL BATCH:

Portland cement . . 631 lbs.  
Natural cement . . . 143 lbs.  
Sand . . . . . 1222 lbs.  
1-inch stone . . . . 1446 lbs.  
2½-inch stone . . 1767 lbs.

## 145 BATCHES AN HOUR speedpav

Paving contractor on a large air base in one of the central U. S. states needed a fast, dependable batch plant that would turn out approximately 130 batches an hour. To meet production requirements, a fully-automatic Johnson one-stop plant was installed on a rail siding, a short haul from the immediate paving area.

#### Supplied by rail, truck

Bulk cement, delivered by rail car, was stored at the plant in three Johnson 825-barrel silos. Sand and stone, delivered by truck and rail, were fed into three Johnson auxiliary storage bins by a traveling stacker. From there, aggregates were fed to the batch plant by inclined conveyor.

#### Kept two 34-E pavers busy

With this efficient material handling system, the 5-compartment bin on top of the batch plant was stocked continually. The plant accurately weighed out aggregates and cement ahead of heaviest schedules — kept two 34-E pavers busy full time pouring 12-inch slab. While the plant's top-speed potential of

180 batches an hour could not be fully utilized due to normal job delays, this reserve production capacity easily assured an average of 130 batches an hour. In fact, during one 11½-hour period of peak operation, it weighed out a total of 1669 batches. That's an average of better than 145 batches an hour.

Actual pour for the 11½-hour day was 2300 cubic yards of concrete — or 200 cubic yards an hour. Each

batch weighed 1.38 cubic yards, and consisted of five materials — sand, two sizes of aggregates, and two types of cement.

#### 20 second batch-time

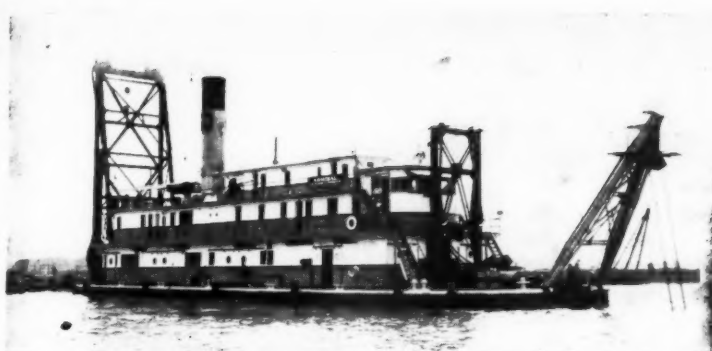
On this one-stop operation, average batcher fill-time was 10 seconds — discharge time, 10 seconds. Automatic control maintained high output, and assured pin-point weighing accuracy of every batch. A separate fully-automatic batcher was used for each of the aggregates and cement — all weighing up at the same time. These single-material Johnson batchers operate on electro-pneumatic control. Fill valves and discharge gates are automatic air ram operated.

Johnson batch plants also can be arranged for two- or three-stop charging. Investigate the possibilities of increasing concrete production on your highway and airport paving. Get the complete story on Johnson automatic batch plants with multiple arrangements of single-material batchers, and one-man push-button control. All sizes, all types. See your Johnson distributor, or write us for latest batch plant catalog.



## JOHNSON automatic BATCH PLANTS

CONTRACTORS AND ENGINEERS



The 27-inch hydraulic dredge, Admiral, pumps up some of the 1,800,000 cubic yards of fill required for the 5,700-foot-long dike.

the Bushy Park project and named Mayor William McG. Morrison, mayor of Charleston, as chairman. The authority is scheduled to issue long-term revenue bonds in the amount of \$3.5 million to cover the purchase of the 4,400-acre Bushy Park tract. This amount also covers construction of tunnels to bring fresh water from Back River to any new industrial developments that locate in a 10,000-acre area south of Bushy Park.

Now that the water-development project is complete, officials are ready to welcome industry into an area that has a deep water harbor capable of handling world-wide shipping, an ample supply of power from the nearby hydroelectric plant, natural gas, a large labor pool, and adequate housing for prospective employees.

The future of the project looks so bright, that Robert Lee confidently secured a stake in the project. Of the \$2,650,000 covering construction of the canal, dike, bridge, and roadways, Lee accepted \$650,000 in cash and the remaining \$2 million in Bushy Park bonds that will be paid off from the sale of industrial sites and water.

#### Personnel

A. K. Duncan was superintendent for the contractor, and Joseph H. Moore, the consulting engineer for the Bushy Park Authority, supervised the operations of the contractor.

THE END

#### Extra-light rehandler added to bucket line

■ A 3/8-yard extra-light rehandler is the latest addition to the Erie Strayer line of clamshell buckets.



Erie Strayer's new 3/8-yard extra-light rehandler.

This bucket is made for use with 6 to 12-ton cranes.

The XLR-38 reportedly has all the features of other, heavier sizes in the E-S line. These features include block-and-tackle and lever-arm action, a rigid one-piece welded head, and continuous wrap-around reeving.

The new model is available with or without teeth and counterweights.

For further information write to the Erie Strayer Co., P. O. Box 1031, Erie, Pa., or use the Request Card at page 18. Circle No. 162.

#### Tandem trucks

■ A line of four and 6-wheel drive tandem trucks for on and off-highway use are described in a catalog from Reo Motors, Inc. Cutaway views of the gasoline or Lpg engines are included. Also shown are various axles installed in the trucks.

To obtain Form No. 4088 write to Reo Motors, Inc., 1331 Reo Square, Lansing 20, Mich., or use the Request Card at page 18. Circle No. 58.

#### Steel pile shoes

■ All-steel pile shoes eliminate the possibility of brooming, according to a mailing piece from the manufacturer, The American Pulley Co. Some of the advantages claimed for the shoes are that they are easy to apply, give a snug fit, and do not come off.

To obtain the mailing piece write to The American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29, Pa., or use the Request Card at page 18. Circle No. 46.

#### NEW small, compact Parsons Trenchliner®

Working height is only 7 feet-4 inches on this new Parsons 155. Width over crawlers is 5 feet-4 inches for work and travel in crowded areas. Yet, there's plenty of work capacity. It digs from 5.8 in. to 25 feet per minute — 16 to 26 in. wide, 8 feet deep. Down-crowd boom is hydraulically controlled. Also has: "Tap-In" teeth, power-shift conveyor, grouser-type treads or flat shoes. (4 other Parsons models in all sizes and types.)

PARSONS • Newton, Iowa  
(Koebling Subsidiary)



#### Light-weight fork lift has 1/2-ton load capacity

Kwik-Mix S-10 Moto-Bug® with fork lift weighs only 1575 lbs., works over light ramps, scaffolds, floors where heavier lift trucks can't safely travel. It lifts 1/2-ton load up to 6-foot height. Forks are 20 or 30 inches long, and adjustable from 6 to 32 inches wide. Tilting mast optional. Fork lift is interchangeable with 10 or 15 cu. ft. hopper, 3/4-ton platform. Bigger Moto-Bug available; also concrete, plaster-mortar and bituminous mixers.

KWIK-MIX • Port Washington, Wis.  
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#### 1-second gravity-dump speeds haul cycles

There's no waiting for slow-acting body-boosts on this job. Koebling Dumptor drives up, body forward — operator trips the body-release lever, and gravity dumps the 6-yard load instantly. Cuts 15 to 25 seconds off cycle-time. And, gravity-dump never balks — never wears out. There's no expensive hoist maintenance, replacement parts, or hoist down-time when you haul with Dumptors®. Better check what this can mean on your work.

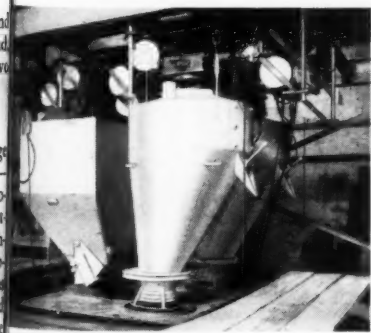


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#### Multiple batch selections

In Johnson single-material plants for roadbuilders' use, dial scale with electric cut-off switch is usually used. When more than one type of batch is required, Johnson single-material batchers can be equipped with mix selector and recorder for 12 different batches — all controlled from central operator's position. (Each aggregate batcher can be equipped with moisture compensator which automatically gives dry weight.) Up to 120 batch selections are available on Johnson automatic concrete plants for dams and commercial ready-mix installations.

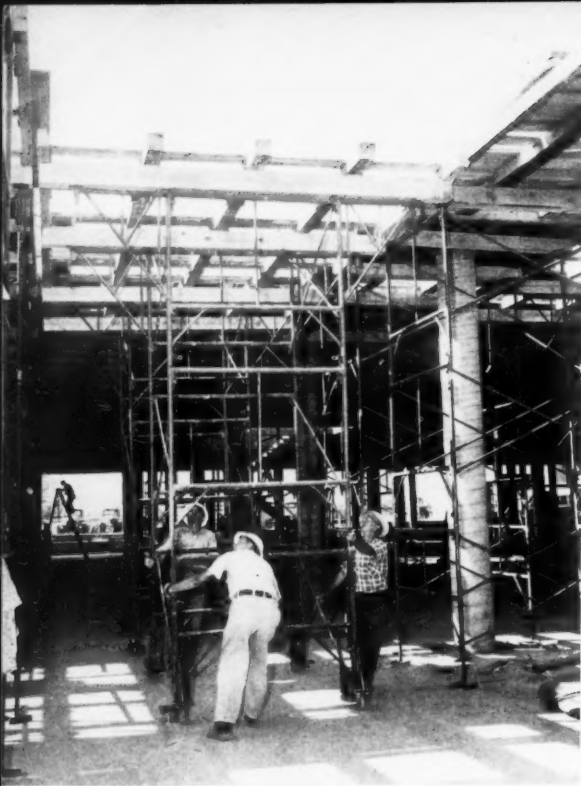
C. S. JOHNSON COMPANY  
CHAMPAIGN, ILL.  
(Koebling Subsidiary)

For more facts, use Reader-Reply Card opposite page 18 and circle No. 215



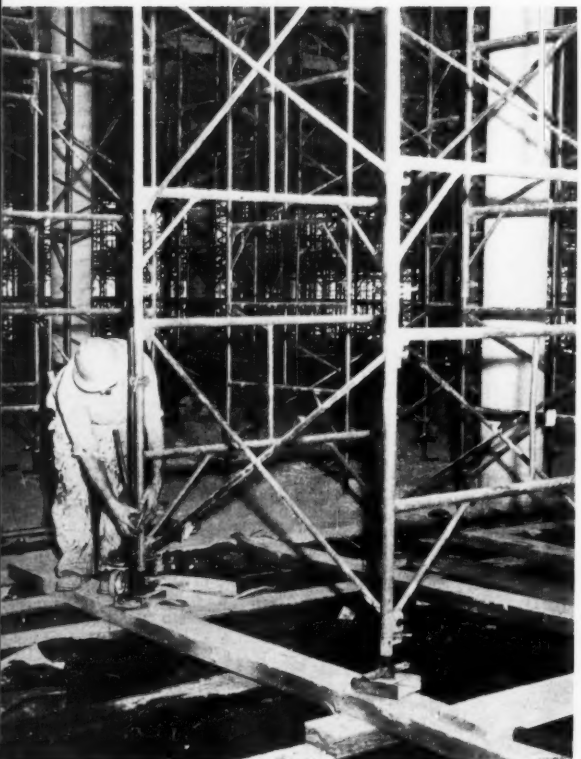
# Forms on wheels speed warehouse construction

**Modular form panels are mounted on tubular steel scaffolding that is built to proper height for floor and roof pours**

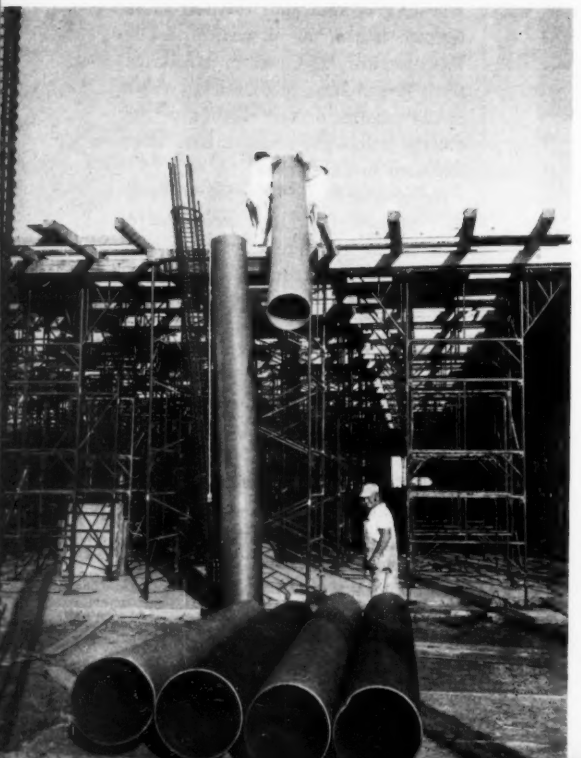


Workmen position the scaffolding. The bench-built panel bolted to the steel scaffold is made of 6 x 8 purlins, 4 x 6 and 6 x 6 joists, and 2 x 6's laid flat for beam bottoms. Steel pans will be installed to finish the forms.

C&E Staff Photos



The Beaver-Advance scaffolding supporting second-floor forming is prepared for a move. Demountable jacks with 5-inch rollers are attached to the eight legs of the scaffolding so that the entire unit can be rolled to a new location.



The 16-foot lengths of 18-inch Sonotubes used for the columns are handled by only two men. A Sonotube leaned against the second-floor forming is quickly pulled up and slipped into place over reinforcing steel at column locations.

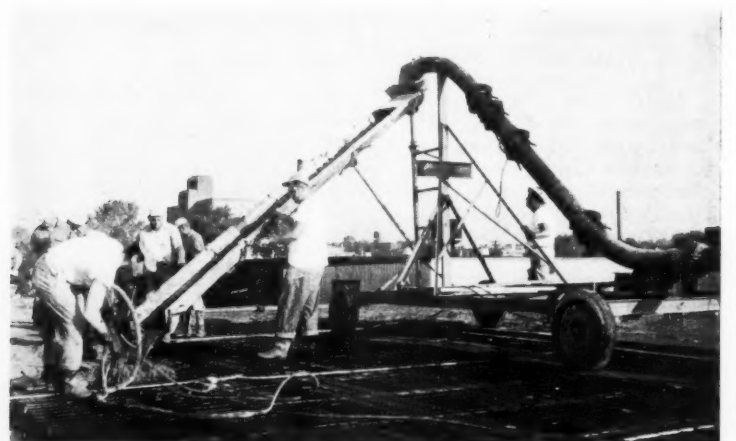
Forms were put on wheels, making it possible to save time and labor and prevent waste of material, during construction of the recently completed Brown Shoe Co., Inc., warehouse in St. Louis, Mo. Workmen for Gamble Construction Co., Inc., St. Louis, were able to roll the modular sections quickly and easily from one position to the next to form and shore the second and third floor slabs and roof of the facility.

Located at 4040 Bingham Street, the warehouse has a main three-story portion measuring 303 x 486 feet. The enclosed loading dock, equipped with 15 large electrically operated doors to serve truck transports, measures 28 x 347 feet. Another two-story unit, measuring 25 x 123 feet, houses the warehouse offices. In all, the building has 14½ acres of floor and roof area.

The form panels for this structure, in modular units of 12 x 23 feet to fit



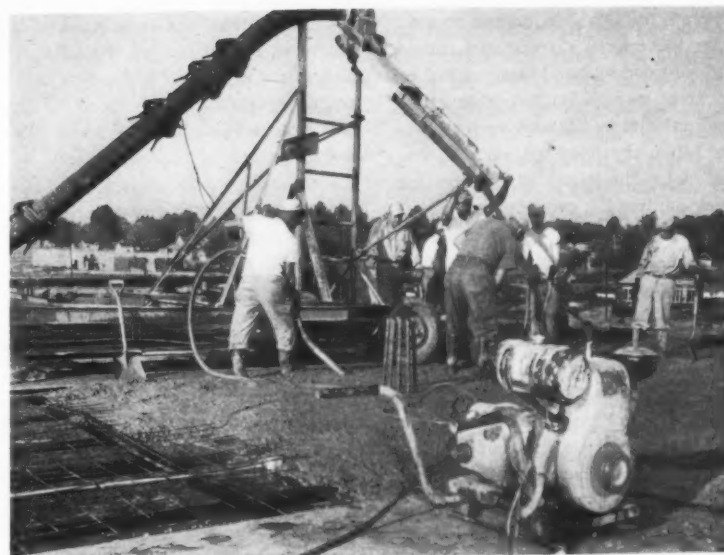
Steel pans, all 12 inches deep and measuring 15 x 30, 20 x 20, and 30 x 30 inches, are set for the floor form. Joist bearers form true lines as movable form sections are fitted together.



Sections of the chute are removed so that concrete is placed in concentric semi-circles right up to the edge of the cart, while a Maginniss Hi-Lectric vibrator consolidates the material. Now the chute will be reassembled and the cart moved to a new location.

CONTRACTORS AND ENGINEERS

Material delivered by the 8-inch Pumpcrete line goes to a hopper and is chuted to the deck. The line is carried on a rubber-tire cart that travels a runway on the forms.



the standard column spacing of the structure, were made up in jigs in the carpenter shop. These panels consisted of four 2 x 6 beam bottoms or joist bearers. Each of these panels was carried on two towers of Beaver-Advance scaffolding. Special panels of sizes required to form bays not of standard size were made up in the same manner.

The form panels were bolted together and to the scaffolding to form a rigid unit. In assembling these units, the wood framing panel was first set on two 4-foot sections of scaffolding and bolted in place. After a crane had picked up this entire assembly, two additional 4-foot sections were slipped into place beneath the first. Succeeding sections of scaffolding were added in this manner until the unit was built up to a height of 16 feet.

Rollers were then attached to the legs of the scaffolding and the section was rolled into position on the floor. During the entire process, the workmen assembling the panels never had to work off the ground. As soon as the form sections were in place, steel pans were installed to complete the forming.

Demountable jacks, each fitted with a 5-inch caster wheel or roller, were attached to the eight legs of the scaffolding so that the modular units could be moved from one position to another. When a jack was in place, the simple throw of a lever operated an eccentric which lifted the scaffolding onto the roller. As soon as the eight rollers were in place, a few workmen rolled the section to its new position. The jacks were then uncoupled from the scaffold legs and used to move the next section.

In order to keep the job moving smoothly and steadily and at a high rate of speed, the contractor built and assembled enough of the form and shoring units to form 50,000 square feet of floor area at one time. Workmen always had enough units available so that they did not have to wait for curing or stripping operations to release form panels, and all of the job operations progressed simultaneously.

#### Drilled pile footings

The new building, finished last month, is supported by 381 drilled concrete piles that were put down by the Wabash Drilling Co., Inc., St. Louis, Mo., with an auger-type drill. Piles range from 24 to 42 inches in diameter and average 37 feet deep. All were drilled to bearing on solid rock and were not belled out on the bottom. The deepest pile went down 44 feet; the shallowest went only 29.5 feet deep. The piles were so spaced that each column rests directly on one of them. Stairways and other incidentals required a few extra piles.

The exterior walls of the building at the first floor level are spandrel beams between the exterior columns. On the north side of the building ad-

jacent to the street, where the first floor level is below the street grade, the wall is of solid concrete and is 12 inches thick and 18 feet high. Like the 12-inch-thick lower walls on the other sides, it is reinforced on both faces.

These walls were formed with Symons form panels, and the concrete was placed by a Koehring 405 crane using a 1 1/4-yard concrete bucket. Ready-mix concrete was supplied by Goltermann Material Co., St. Louis, Mo.

The first floor is a 5-inch reinforced-concrete slab placed directly on the prepared grade. Most of the  
(Continued on next page)



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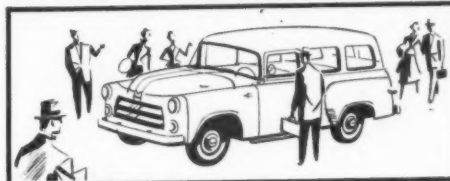
With seats in place, one model carries six passengers, the other eight. In the six-passenger model you've got about 90 cubic feet of load space in the rear compartment. The same amount of space is available in the eight-passenger model with the rear seat removed. You can also take all extra-passenger seats out of either model, leaving clear, unobstructed room for a big, truck-size payload of 1575 pounds.

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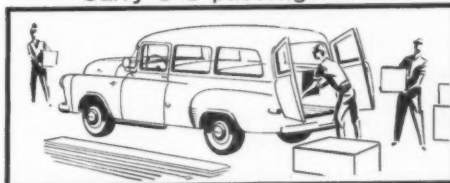
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concrete for this slab, poured directly from the transit mixers, was spread and screeded by hand and finished by workmen using a Whiteman finishing machine and two Master power trowels. When the floor was poured, several strips the length of the building were omitted to provide for expansion during the construction period. These were later filled in to complete the floor.

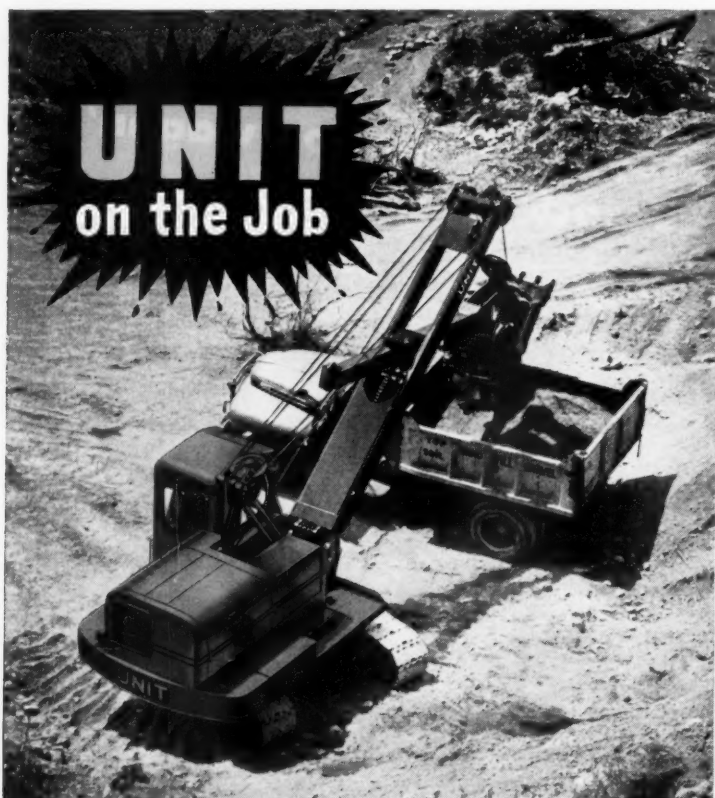
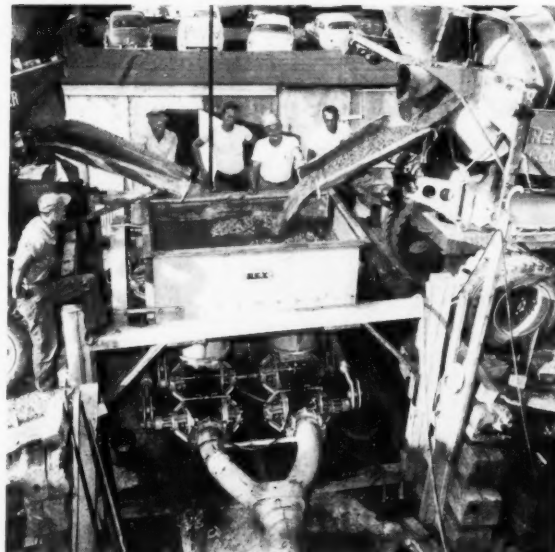
The second and third floors and the roof of the warehouse, of slab and joist construction, were formed with steel pans. The floor slabs are 3 inches thick and the slab of the roof, 2½ inches thick. Joists are 5½, 7½, and 9½ inches wide, and all are 12 inches deep.

The floor and roof forms were supported on sections of Beaver-Advance

scaffolding that had been built to a height of 16 feet for the second floor slab to correspond with the first floor ceiling height. As soon as any unit was not needed for this floor, one 4-foot section of scaffolding was removed and the unit was hoisted to the second-floor level by the crane. These 12-foot units were used on the second and third floors to form the third-floor slab and the roof slab, respectively.

The ease and speed with which these forming sections could be stripped, moved, and re-set contributed much to the progress of the work. Stripping was simply a matter of lowering the built-in jacks in the bottoms of the scaffold legs. When the units were to be re-set, a jack raised the scaffold to exact grade, and

Ready-mix concrete for the Pumpcrete setup is delivered by two Jaeger mixers mounted on International trucks. Trucks back up ramps on either side of the hopper so that as one finishes dumping, the other can begin.



## SWING SPEED makes PAY LOADS!

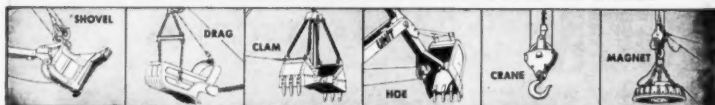
Here's a UNIT ½ Yard Shovel doing a PRODUCTION DIGGING JOB in a gravel pit. UNIT owners like the ease of operation and the FULL VISION CAB for complete visibility. They also like the sturdy construction and the many mechanical features, plus the ECONOMICAL PERFORMANCE and LOW UP-KEEP which all add up to EARNING POWER. Why not investigate what UNIT can do for you — on YOUR next excavating and material handling job?

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the leg jacks were then run down to firm footing on wood blocks that had been placed on the floor slab.

One of the best features of the sections was that the form units remained undamaged during the stripping or reassembling processes. The timber framing of each unit was rigidly bolted together when it was built and was re-used many times during the job without ever being disassembled. A few cleats held the adjacent units together, and a few small nails held the pans in place. Aside from these, there were no nails to drive or pull out.

When the framing units were in place and up to grade, the drop panels, which were the same depth as the joists, were formed around the column heads. These were formed with flat sheets of ¾-inch plywood laid directly on the framing panels and held in place with small nails.

The Sonotube column forms for the

18-inch round columns were placed next. Even the 16-foot lengths used for the first-floor columns were light enough to be handled by two men. Two workmen stood the tubes up against the edge of the second floor forming and two men on the deck pulled the forms up, carried them to the column locations, and slipped them down into place over the reinforcing steel cages that had previously been placed.

Of the 840 Sonotube column forms required, 280 were 16 feet long and the remaining 560 were 12 feet long. All were 18 inches in diameter. The 18-inch-square exterior columns of the building were formed with plywood forms backed by 2 × 4 cleats and tied with column clamps.

To complete the deck forms, the contractor set steel pans on the timber joist bearers. The design required several sizes of pans, most of which were 30 inches wide. The common

## WISCONSIN-POWERED

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Write for Bulletin S-188.



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World's Largest Builders of Heavy-Duty Air-Cooled Engines  
MILWAUKEE 46, WISCONSIN

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CONTRACTORS AND ENGINEERS

Where there is no floor, the scaffold runs on a plank runway. The form was first bolted to a 4-foot section of scaffold, then this unit was lifted atop another 4-foot section by a crane. A third section brought the assembly to the 16-foot height required for the first-floor ceiling.

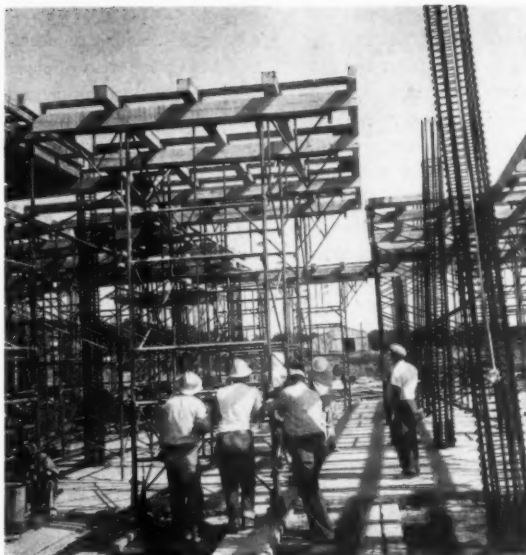
sizes used were 30 x 30, 30 x 20, 30 x 15, and 20 x 20. These pans, all of them 12 inches high, were furnished and installed by Gateway Engineering Co., Chicago, Ill., under a subcontract.

Ready-mix concrete was used throughout the job, but was placed by at least four different methods. Concrete for the first floor slab, drilled pile footings, and other accessible units was chuted directly from the ready-mix trucks to the forms. Concrete for the less accessible sections, such as the higher exterior walls, was placed by the Koehring 405 crane with a 1 1/4-yard concrete bucket. The 60-foot boom and 15-foot jib of the crane enabled it to reach many of the columns and some of the deck, in addition to the exterior walls. Concrete for most of the columns and other small pours above the ground level was placed by buggies after the material had been hoisted to the floor by a Buck hoisting tower. These three methods were used for almost all pours, except those for the deck slabs.

#### Decks placed by Pumperete

Deck slab concrete was placed by a Rex Pumperete setup located near the middle of the south side of the building. Two ramps of timber and gravel were built up on opposite sides of the Pumperete hopper so that two ready-mix trucks could discharge concrete into the hopper. When one mixer was empty, the other started dumping, so that there was no chance of the hopper being emptied.

The ready-mix concrete was supplied by Goltermann Materials Inc.,



St. Louis, and delivered in Jaeger transit mixers mounted on International trucks. The mix was designed and controlled by the laboratories of the Robert W. Hunt Co., St. Louis. No additives were used in the concrete, but up to 2 per cent calcium chloride was added to the mix in extremely cold weather.

An 8-inch pipeline was carried from the Pumperete to the deck being poured. At the end of the pipe, the contractor had an ingenious and efficient arrangement for distributing the concrete. The line terminated on a large cart, measuring about 8 x 12 feet. This was carried on four automobile wheels and tires that traveled on a runway on the forms. The concrete pipe was inclined upward on the rig and terminated in a small hopper

## GALION "Chief" 3 WHEEL ROLLERS

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DRIVE — AS STANDARD EQUIPMENT



#### EIGHT COMPACTION WEIGHT SIZES

##### BALLASTABLE ROLLS

10-13 Ton	20"
10-14 Ton	24"
12-15 Ton	20"
12-16 Ton	24"

##### SPOKE ROLLS

10 Ton	20"
10 Ton	24"
12 Ton	20"
12 Ton	24"

### OUTSTANDING FEATURES

- Large diameter, extra-heavy steel drum rolls provide VARIABLE WEIGHT. Simply fill the rolls with water to obtain the weight and compression desired. Also available with non-ballastable, cast rolls (spoke type).
- ROLL-O-MATIC Torque Converter Drive is STANDARD EQUIPMENT. It saves up to 25% in fuel. Increases life of engine 35% and forward-reverse clutches 40-50%. No master clutch, no gears to shift, no shock loads. Reversing action is velvet-smooth.
- Hydraulic steering for easy operation.
- Simplified controls — within easy reach of operator on platform.
- Differential lock controlled from cab.
- Gasoline or diesel engine available.
- Space is provided under streamlined housing for built-in sprinkler tank when ordered (an extra).

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### GALION Gives the Most Effective and Economical DRIVING POWER

The Galion ROLL-O-MATIC Torque Converter Drive differs from a fluid coupling drive which never multiplies engine power and requires a manual gear shift mechanism.

The Galion ROLL-O-MATIC Torque Converter Drive has no gear shift mechanism. Furthermore, it automatically MULTIPLIES the engine driving force by means of oil in motion instead of by transmission gears. It automatically APPLIES the driving force as the work demands. When the Governor Lever is moved to a selected rolling speed, the engine power will be applied and regulated AUTOMATICALLY — up hill, on the level, down hill, and around curves.

\* Utilizing a General Motors-Allison Torque Converter



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In Canada: Construction Equipment Co., Ltd.  
Toronto Montreal Halifax

For more facts, circle No. 219

JULY, 1956

### MOTOR GRADERS · ROLLERS



TRENCH ROLLERS PORTABLE ROLLERS 3-WHEEL ROLLERS TANDEM ROLLERS MOTOR GRADERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.

Cable address: GALIONIRON, Galion, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 220



about 10 feet above the deck forms.

Concrete from this hopper was discharged into a long sectional chute that swiveled more than 180 degrees around one end of the cart. At the beginning of a pour, the full length of the chute was used to distribute concrete in an arc around the cart. Then one section of the chute was removed, and concrete was distributed in a concentric area just inside the larger arc. Successive sections of the chute were removed, making it possible for concrete to be placed right up to the wheels of the cart.

After a section of the pipe leading to the cart had been removed, and the cart rolled ahead and coupled to the pipe again, the chute was reassembled to its original length, and the operation repeated. By this method a sec-

tion of deck more than 40 feet wide was placed in one pass. The time lost during the shutdown to move the cart ahead was extremely short.

As concrete was placed, it was vibrated by a Maginniss electric vibrator powered by a Maginniss generator. The workman using the vibrator worked the concrete well into the joists and around the reinforcing steel, and a very smooth surface resulted when the pans were removed.

The concrete was struck off to grade with a roller screed and floated to remove irregularities. As soon as it had set sufficiently, the surface was finished with the Whiteman floor finisher and two Master power trowels, then gone over twice with hand trowels. As soon as the concrete was hard enough so that it would not be dam-

aged by curing materials, it was covered with Sisalkraft paper and sand and kept wet for ten days.

In addition to the general contract held by Gamble Construction Co., there were separate contracts for specialized work let by the owner. The building's sprinkler system was installed under a separate contract by Automatic Sprinkler Corp. of America; electrical work went to S. C. Sachs Co.; and work on the heating system went to Kremer-Hicks Co. The plumbing was done as a subcontract of the general contract by E. J. Fisher Plumbing Co. All these contractors are located in St. Louis, Mo.

Equipment in the building includes two hydraulic elevators, conveyors to handle freight from floor to floor and on the three floors, and a fully auto-

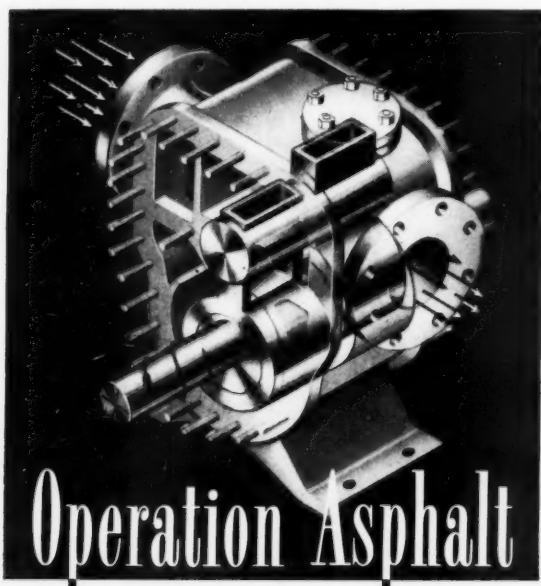
matic sprinkler system.

A special ordinance revised the St. Louis Building Code to permit the use of panel wall construction for the exterior of the buildings. The insulated aluminum panels making up the exterior of the building are the first to be used under the revised ordinance. Corners of the building are being finished with brick.

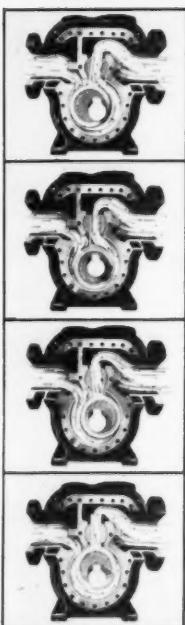
#### Personnel

The new building was designed by Neal J. Campbell, and construction was supervised by the owner. The general contractor's activities were supervised by job superintendent L. H. Prange. Paul Cotton was resident engineer representing the owner, Brown Shoe Co. L. A. Bannes was general superintendent and the designer of the forms.

THE END



## Operation Asphalt



#### THE INSIDE STORY ON

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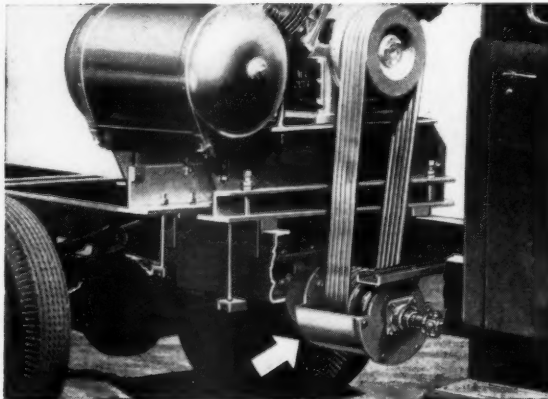
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The above illustration of a CEMCO Takeoff at work is only one of many applications where the truck motor also powers equipment mounted on the truck. The Takeoff rotates in same direction as drive shaft and at same speed, and, on a typical 2 to 2½-ton truck, delivers 65 to 75 B.H.P. at 1750 RPM. On a heavy-duty truck, at 1750 to 2000 RPM, the delivered B.H.P. will be from 150 to 200.

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Everything important to the job is at hand—truck, power, and equipment! Send for detailed information regarding your needs. Engineering help available for you, if needed.



This CEMCO Mobile Machine Shop — for maintaining heavy-duty construction equipment — makes over 2,000 tools available for on-the-spot servicing

**CEMCO** INDUSTRIES, INCORPORATED  
GALION, OHIO

For more facts, circle No. 222

#### "Bosun's chair" rig has variety of uses

■ A new contractor's aid, the Sky Climber, for rigging scaffolding and for one-man operations employing a "bosun's chair" is announced by Western Gear Corp. The unit can be operated by hand or by electric or air-powered motors.

No restriction on the length of the cable which can be used is a feature of the Sky Climber, according to the



The Sky Climber can be operated manually or by means of a motor.

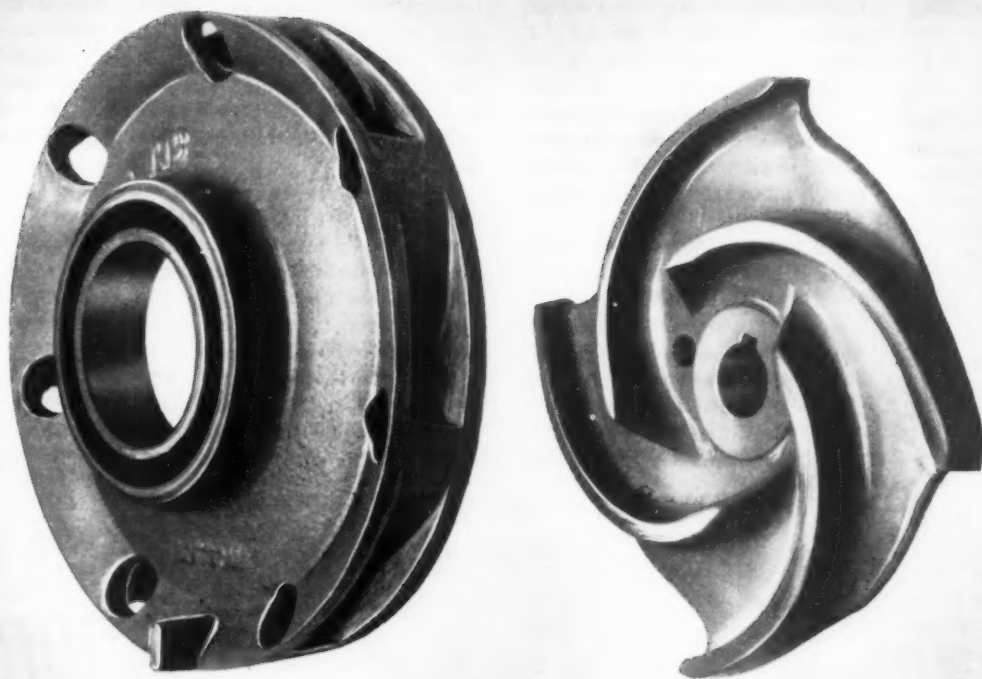
manufacturer, so that there is no need for transferring in mid-air on tall drops. Build-up of cable on the drum is eliminated, and in manual operation no more energy is required at the crest of a 400-foot drop than at ground level.

Another feature is that the Sky Climber doubles its lifting capacity of 1,000 pounds through the use of fairlead blocks, and cross-over or pile-up of cable is eliminated. It can be quickly converted to air or electric-power operation on the job.

The Sky Climber weighs only 30 pounds, and an air motor attachment weighs 18 pounds. The unit's safety features conform to or exceed all safety regulations, it is reported by the manufacturer.

For further information write to the Western Gear Corp., P. O. Box 126, Belmont, Calif., or use the Request Card that is bound in at page 18. Circle No. 4.

CONTRACTORS AND ENGINEERS



A pump diffuser and a pump impeller. These two parts mean fast, dependable priming and economical rebuilding after long, hard service.

## Replacing Two Simple Parts Restores Pump's Full Efficiency

### Modern "Diffuser" Pumps Rebuilt Easily, Rapidly, Inexpensively

Metal parts in any pump will wear after hard service, particularly when handling suspended sand or abrasive solids. Therefore, economical rebuilding is essential. In diffuser-primed pumps, rebuilding is accomplished by replacing two simple parts — the diffuser and the

impeller. It is not necessary to replace the expensive pump casing. Full factory efficiency is restored with the replacement of these parts. Replacement of the diffuser and impeller is easy and the parts are inexpensive and readily available.

Diffuser-primed pumps are fast priming, resistant to clogging and economical to rebuild . . . and only a Marlow pump is diffuser primed. Ask your dealer to show you Marlow's Contractor's Pumps and the two inexpensive replacement parts. They mean better pumping and greater economy to you.



This is "diffuser priming." Note the 360° cleaning action and the "multiple point priming."

Diffuser-primed pumps are the only contractor's pumps which offer this cost-saving advantage and also provide the other two essential requirements of self-priming pumps: quick priming action and clog resistance.

Quick priming is obtained in Marlow Contractor's Pumps because the diffuser provides a multiplicity of priming points. Each vane in the diffuser performs this function. With at least six vanes in the Marlow pump, it tends to separate air faster, thus priming more rapidly.

When a Marlow is primed, water is discharged through all diffuser ports around a full circle. Dirt and debris cannot accumulate because its 360° cleaning action clears clogging accumulations at the base of the pump casing. There are no dead segments to hold muck and silt which reduce pumping efficiency.



6-130A

## MARLOW PUMPS

Division of Bell & Gossett Company  
MIDLAND PARK, NEW JERSEY

Morton Grove, Illinois

Longview, Texas

For more facts, use Reader-Reply Card opposite page 18 and circle No. 244



## Labor review

The Davis-Bacon schedule of wage rates included in a general construction contract "is not a representation of warranty as to the prevailing wage rates in the contract area," the U. S. Court of Claims ruled recently in a suit brought by a contractor against the Federal government. "The act is a minimum wage law," the court said. "Its requirements that the contractor pay 'not less' than the specified minima presupposes the possibility that the contractor may have to pay higher rates."

The decision was a result of a suit for damages by L. Balkin Builder, Inc., which constructed and repaired buildings at Ft. Sheridan, Ill., under a contract with the U. S. Army Corps of Engineers. The contract specified prevailing rates as determined by the U. S. Department of Labor. Subsequent to the drawing of the contract, area wage rates were increased.

The suit claimed the government had "misrepresented" the rates in the area. The court answered that, "even assuming a representation by the government as to the prevailing rate, respondent's reliance on the representation in computing the bid cannot be said to have been justified."

Now that the U. S. Supreme Court has ruled that state right-to-work laws do not outlaw union-security provisions negotiated by the railroad unions, the AFL-CIO believes congress has an "obligation" to permit the union shop in all 48 states by removing Section 14(b) from the Taft-Hartley Act—the section that specifically says union-shop provisions can be outlawed by the states.

In the lead editorial of its monthly publication, the "News", the AFL-CIO pointed to a lack of uniformity in Federal policy that discriminates against workers outside the railroad industry. "Congress has said the union shop is o.k. on the railroads in all 48 states," the editorial pointed out. "Congress has said—in the Taft-Hartley Act's Section 14(b)—that in every other industry the union shop is o.k. only in those states that permit it. Clearly, there's a lack of uniformity. . . non-transport workers should have the right to negotiate union shop contracts, too, without interference from the states.

"Congress should . . . 'clear the track' for action," the editorial concluded.

A welfare fund disclosure bill has been introduced in the House of Representatives, different in one respect from the measure before the Senate (See C&E, Labor Review, June, pg. 148). The House version would put the administration of the plan in the hands of the U. S. Department of Labor rather than the Securities & Exchange Commission. The AFL-CIO has objected to the SEC as being too "management-minded."

In a letter to state and local affiliates of the International Trades Unions, the president of the AFL-CIO Construction Trades Department, Richard Gray, called off the no-merger policy directed by his department several weeks ago. He wrote, "AFL-CIO President George Meany has proposed a new method of solving jurisdictional troubles which, we believe, will be the means of settling this controversy. . . ."

The resolution (See C&E, Labor Review, June, pg. 149) had directed the state and local bodies to postpone merger of CIO and AFL organizations until the jurisdictional disputes between the craft and industrial unions were resolved. The main problem concerns who will handle construction and installation of new buildings and

machinery at industrial plants that are expanding or modernizing.

The craft unions claim the right to such jobs as belonging to them historically, while the industrial unions feel such work either comes under the heading of maintenance, which is their bailiwick, or is theirs by virtue of clauses in their individual plant contracts.

Soon after the resolution was passed by the Construction Trades Department, the body issued a memorandum to its affiliates designed to show why the no-merger order was sent out. The memorandum was a chronology of events during the past six years that justified the no-merger resolution. The paper took the industrial unions to task for "blocking the building trades' Taft-Hartley amend-

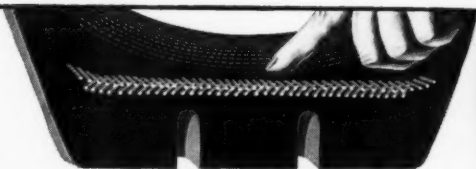
ments" because the industrial unions want to use "the Taft-Hartley Act against the building trades for the purpose of taking over our construction work jurisdiction."

The chronology was followed by another memorandum which set forth a "brief analysis of actual job conflict involving a trespass by industrial unions on building trades jurisdiction since the merger of the AFL and CIO." The 18 cited cases consisted of 11 disputes between building trades unions and former CIO affiliates and seven between building trades unions and former AFL unions.

Frank J. Rooney, president of the Associated General Contractors of America, told a press conference that he felt "sure" the highway builders of



# Announcing



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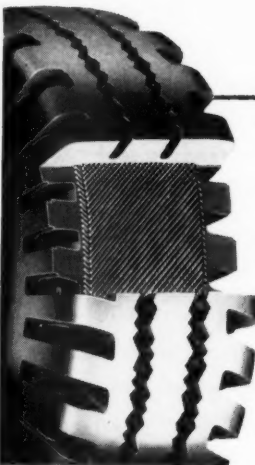
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- ★ New Chemi-Balanced Tread Compound—resists cutting, chipping
- ★ New Wide-Angle Grooves—actually roll away from stones

the nation could handle a multi-billion dollar construction program in a manner that would not push the cost of such construction out of line with current estimates. Although he admitted that the program is a challenge, he believes AGC activities have helped put the industry in a position where it can handle what is apparently ahead.

When questioned about a possible shortage of skilled personnel, Rooney explained how an AGC committee has been working with the Association for Engineering Education in encouraging engineering students to take a look at the opportunities presented by the construction industry. He also described how the AGC has been going to the local level and talking to young men at high schools and other meet-

ing places, informing this potential work force as to the opportunities available to the skilled construction worker.

A proposed amendment to the Taft-Hartley Act introduced by Sen. Curtis (R., Neb.) would not only stop all secondary boycotts but would also outlaw organizational and recognition picketing.

The goal of meeting every target date in the erection of the world's first bronze skyscraper, a 20-million dollar, 38-story structure on Park Ave. in midtown New York City, was put in jeopardy last month when new traffic regulations went into effect in the construction area. Up to the time of the new edicts, every target date on the master construction schedule had

been met, some on the exact date.

Traffic Commissioner T. T. Wiley's "Operation Crosstown"—designed to speed traffic in the midtown area—calls for strict enforcement of no-parking, no-standing rules during certain hours on one side of every cross-town street in the congested midtown section. Drivers attempting to deliver lumber and steel to the construction site were shooed away by a reinforced detail of New York police, on hand to enforce the new regulations.

Some truckers tried to stop long enough to deliver their loads anyway. They were promptly hit with traffic summonses. After three summonses were handed out, the truckers called it a day and returned their fully-loaded trucks to the North River pier from which they had started. With no

girders to be installed, work on the skyscraper stopped.

Wiley finally agreed to modify the new regulations on the streets adjacent to the new building so that the truckers could deliver their loads, but nearly three days of work on the building had already been lost.

Traffic congestion is the reason for another new regulation in New York City which would have a hindering effect on construction. The Borough of Manhattan has proposed to prohibit the use of mobile cranes on the borough's streets except in cases of absolute necessity to prevent hardship. In a discussion with Borough President Hulan E. Jack, the chairman of the Building Trades Employers' Association, Peter W. Eller, pointed out that a complete ban on the use of cranes would return the building industry to the methods used "in the building of the pyramids."

A representative committee of leaders in the construction industry, headed by Fred J. Driscoll, former president of the BTEA, has been meeting with borough officials to try and work out a solution acceptable to all. The committee has explained its case and awaiting a decision from the Borough President and his Commissioner of Public Works.

Not helping the case of the construction industry was the collapse of the 180-foot boom of a crawler crane at the site of a new 17-story apartment house on the east side of Manhattan a few days after the committee aired its opposition to the crane ban. Luckily, the crane showed signs of something being amiss 3 hours before it finally fell.

Buildings threatened by the boom were evacuated, but the rig held together long enough for an 80-foot rescue crane to lower it most of the way and it didn't snap until it had been eased to within 5 stories of the street, damaging only a light stanchion.

Last month, construction workers and their employers in Des Moines, Iowa, found its building tradesmen on a daylight time schedule while the workers' bosses remained on standard time.

In Des Moines, the fast time is in effect for all municipal agencies, but the rest of the city ticks along on standard time. The Building & Construction Trades Council said its contracts "call for us to work from 8 a.m. to 4:30 p.m., and as far as we are concerned the city (government) establishes our time."

And so, while the workers show up according to daylight time, the Des Moines Builders Association, its suppliers, and transportation are abiding by standard time.

All other AFL-CIO members, including highway and bridge construction workers, are going along with standard time. The sun, meanwhile, has been rising and setting according to its usual schedule, to the apparent dissatisfaction of no one.

It would seem simpler if both factions involved could get together and decide on a common time schedule.

# AN ALL-NEW, ALL-WHEEL ON-AND-OFF-THE-ROAD TIRE Invulnerable to cuts and ruptures in the vital tread area!

You are looking at an entirely new kind of truck tire—the new U. S. Royal Super Fleetmaster. Its exclusive Safety Steel Shield makes it so immune to road hazards that it runs over spikes and razor-sharp blades without losing a pound of air!

Put the new Super Fleetmaster on any wheel and watch it outperform! On front wheels, it gives greater stability. On drive wheels, it delivers extra traction. On trailing wheels, it lasts for recap after recap. Standardize on this great new tire—and reduce inventory expense!

## Super FLEETMASTER

**SAFETY STEEL SHIELD\***

Mount this great new tire on dump trucks, transit mixers, log haulers... on any wheel exposed to heavy impacts, sharp objects, murderous terrain. You'll enjoy fewer tire failures, less downtime expense and greater service dependability.

Right now, your U. S. Royal Dealer has the new Super Fleetmaster with exclusive Safety Steel Shield in sizes through 11.00. See him—as soon as you can. And remember, you can specify "Super Fleetmaster" on your new equipment!

\*Patent Applied For



For further information write, Truck Tire Department

### United States Rubber

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IN CANADA: DOMINION RUBBER COMPANY, LTD.

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The Dun-Lockin device for truck tailgates made by the U. N. Co., of Boston.

### Automatic lock device for truck tailgates

■ An automatic tailgate lock that unlocks a truck tailgate when the body

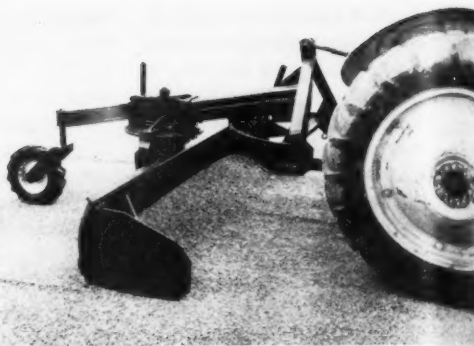
goes up, and locks it when the body goes down, is manufactured by the U. N. Co.

This completely mechanical lock attaches in a matter of seconds to any type of dump truck, including trailers. It is easily detached when manual control of the tailgate is required.

According to the manufacturer, the Dun-Lockin automatic tailgate lock saves time and prevents accidents in that it eliminates the necessity of the operator getting out of the cab. The tailgate is said to be securely locked by the device, so that shock or jars will not spring it open.

For further information write to the U. N. Co., Inc., 1255 Boylston St., Boston 15, Mass., or use the Request Card at page 18. Circle No. 126.

The new tail wheel and scarifier tooth assembly on the Servis ditcher-terracing blades.



### Tail wheel, scarifier for ditcher blades

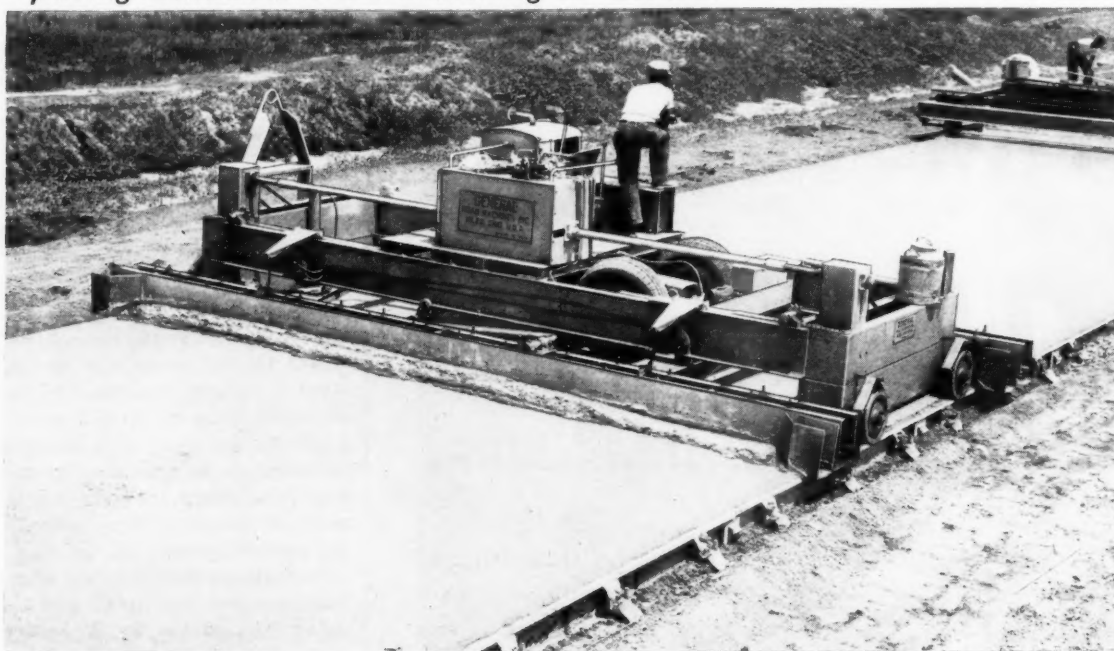
■ A reversible-type tail wheel and a scarifier tooth assembly are now available as optional equipment from the Servis Equipment Co. for both its

regular and heavy-duty, three-way ditcher-terracing blades.

The attachments are recommended for leveling operations. The scarifier teeth are 9 inches long, and are made of heat-treated molybdenum steel. With optional, easily installed end plates, the blades can be used as a scraper.

For further information write to the Servis Equipment Co., 1000 Singleton Blvd., Dallas, Texas, or use the Request Card at page 18. Circle No. 94.

## paving contractors are switching to General...



GRM Model 5-S standard 20-25 ft. Finisher working on Rt. M-60 by-pass.

## GENERAL FINISHER

*speeds paving production for Garavaglia and Pierson!*

Typical of leading contractors now using General Road Machines paving equipment is Garavaglia & Pierson, Centerline, Michigan.

On their 8 mile by-pass job along Rt. M-60 at Niles, Michigan, they are using 2 GRM Model 5-S Finishers, 1 standard 20-25 ft., 1 self-widening 10 to 16 ft. and a GRM Automatic Curing Machine.

Paving Superintendent Dave Stein says, "Our GRM equipment has performed well in all respects. We feel that the simple, rugged construction of each machine will pay off in longer life and less maintenance. The wide screeds on the finishers do an excellent job of controlling surge behind the screeds."


Users report that the General Finisher produces better results in less time. Its range

of 6 travel speeds and 24 screed speed combinations permits selection of the finishing rate exactly suited to individual paving job requirements.

What's more, the Finisher's rigid structural steel frame, V-belt transmission drive and anti-friction bearing construction provide smooth operation, eliminate form-damaging rocking and twisting.

These and many other features will assure increased production, lower costs and extra profits on your jobs! Ask your General Road Machines distributor for more information about this advanced design Finisher, available in widths up to 32 ft. It's a part of General's complete line of modern paving equipment.


AA-3704



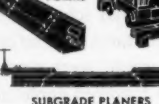
## GENERAL ROAD MACHINES, INC.

GENERAL FIVE STAR EQUIPMENT


Niles, Ohio




SIDEWALK FORMS




SUBGRADE PLANERS




FLOAT MACHINES




AUTOMATIC CURB BUILDERS



SPREADERS



AUTOMATIC CURING MACHINES



COMBINATION CURB AND GUTTER FORMS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 224.

### Setting gun developed for all blind rivets

■ A new blind-rivet setting gun developed and manufactured by the Townsend Co. is designed for operation with a standard 1/4-inch electric or pneumatic drill. The new gun will set all lengths and all diameters of aluminum, steel and monel cherry rivets, and Townsend commercial rivets.

Blind rivets are set by a pulling action. This is provided as the rotating



The new blind-rivet setting gun developed by the Townsend Co.

drill attached to the gun turns a nut case on a movable screw shaft which actuates the pulling head drawbolt. The shaft and drawbolt automatically return to starting position after each rivet is installed.

The shaft is inserted in the 1/4-inch chuck of the drill motor. The gun is held in one hand and the drill in the other, and the pulling head is slipped onto the rivet stem. The drill motor is started and the gun is pushed against the rivet head in line with the rivet stem. The pushing action engages the clutch faces and sets the rivet. When the pulling stem of the rivet breaks, the gun is removed from the work.

For further information write to the Townsend Co., P. O. Box 237-Z, New Brighton, Pa., or use the Request Card at page 18. Circle No. 147.

CONTRACTORS AND ENGINEERS

## paving vibrator suitable for widths up to 25 feet

■ A new full-slab paving vibrator attachment, said to improve concrete quality and increase production on airport and highway-paving jobs, is announced by the Maginniss Power Tool Co.

The attachment consists of Maginniss Hi-lectric motor-in-head vibrators spring-mounted on 28 to 30-inch centers on a sectional tubular steel frame, and mounts directly on any spreader or finisher. No auxiliary carriage is required because the attachment becomes an integral part of the machine, the manufacturer says.

Suitable for use on pavement slabs of widths up to 25 feet and from 4 to 19 inches deep, the Maginniss full-slab vibrator attachment operates on 180-cycle, 120-volt, 3-phase current supplied by a gasoline-engine-driven Hi-lectric generator of suitable capacity. Vibrating frequencies of from 5,000 to 10,000 vibrations per minute are obtained by regulating the generator speed. The machine operator controls vibrator position, operation, and frequency to suit concrete consistency and other job conditions.

For further information write to the Maginniss Power Tool Co., 154 Distl Ave., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 132.

## Slab separating agent leaves clean surface

■ A separating agent for use in the bulk precasting of concrete deck and wall slabs is offered by E. A. Thompson Co. According to the manufacturer, use of this water seal assures clean bond-breaking without suction or sticking, and no film or residue is left to interfere with painting.

The compound provides uniform curing, inhibiting hairline and shrinkage cracks and producing a harder, dust-free concrete, the manufacturer points out. It is also said to safeguard against water seepage and hydrostatic pressure.

For further information write to E. A. Thompson Co., Inc., 1355 Market St., San Francisco, Calif., or use the Request Card at page 18. Circle No. 104.

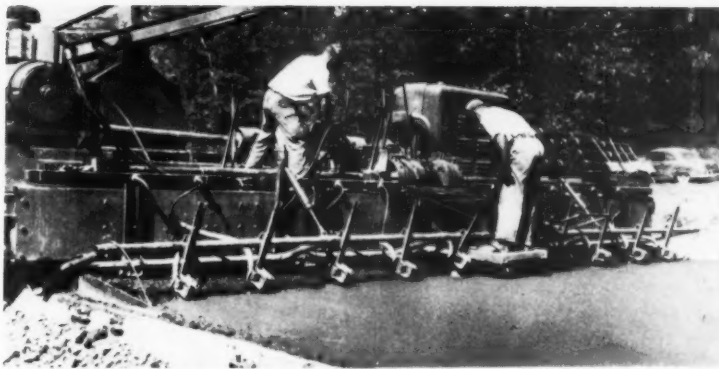
## New drawing instrument

■ A drawing instrument which is said to enable a draftsman to draw successive parallel lines equally spaced is made by Handee-Dandee Products, Inc. The instrument, called the Handee-Dandee, measures  $8\frac{1}{2} \times 12$  inches. It includes an adjustable protractor,  $\frac{1}{4}$ -inch pointers, and templates for making circles, french curves and common symbols.

The Handee-Dandee features a  $\frac{1}{8}$ -inch scale as well as a  $\frac{1}{4}$ -inch scale. The manufacturer states that it is extremely accurate and precise. It is manufactured of syrene plastic.

For further information write to Handee-Dandee Products, Inc., 3019 Pico Blvd., Santa Monica 8, Calif., or use the Request Card at page 18. Circle No. 145.

For more facts, circle No. 225→

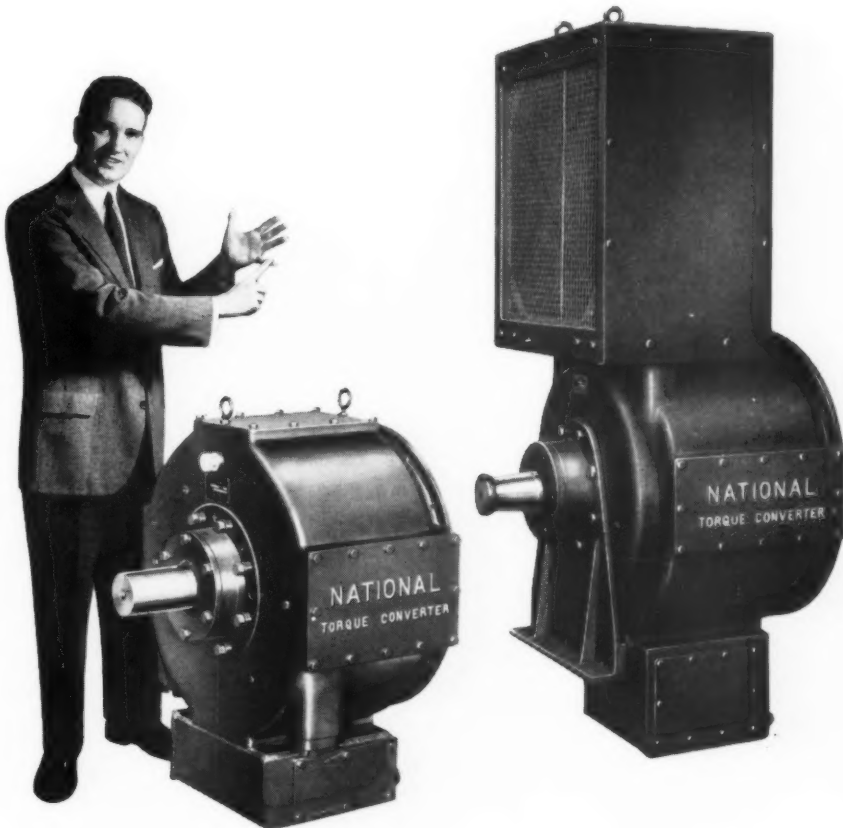


Uniform vibration of a 24-foot x 9-inch highway pavement slab is provided by 10 Maginniss motor-in-head, full-slab vibrators.

## Line of rubber products

■ A catalog on the construction line of mechanical rubber products manufactured by Boston Woven Hose & Rubber Co. is available. Some of the products described are dredging, steam, concrete, and water hoses; V-belts; and packing and tape. Cutaway views, plus information on various types, sizes, and diameters, of these products are included.

To obtain the catalog write to Department 3391E, Boston Woven Hose & Rubber Co., P. O. Box 1071, Boston 3, Mass., or use the Request Card at page 18. Circle No. 47.



## you get all these features with a National Torque Converter

Now, with National Torque Converters, you can give your equipment smoother power, steadier power over a wider range of loads . . . with exact matching of torque converter to engines of 100 to 1000 horsepower . . . plus *all* these features:

**Unsurpassed durability:** The rugged design and construction of National Torque Converters provide longer service life with minimum maintenance.

**Simplicity of design** of National Torque Converters permits ease of installation, operation and maintenance.

**Reproducible efficiency** of each size and capacity of National Torque Converters permits standardization on your equipment with assurance of uniform top performance on every job.

**Top performance:** Precision fabrication of National Torque Converters of parts made to close tolerances provides

uniformly smooth transmission of power hydraulically from engine to job or load, enabling engine to operate at its optimum speed and thus, to deliver maximum horsepower as required . . . and without ever stalling the engine.

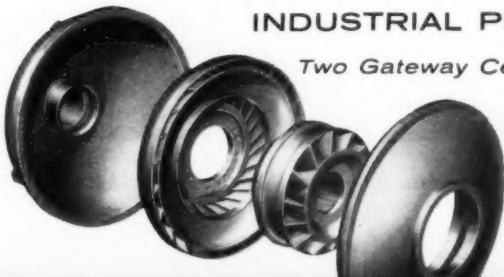
**Faster job cycles:** Quicker starting and faster acceleration of load with a National Torque Converter in the power system means more work per equipment per operator per day . . . every day.

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Why not let a National engineer make specific recommendations of the correct size and capacity of National Torque Converter for your equipment.

## THE NATIONAL SUPPLY COMPANY INDUSTRIAL PRODUCTS DIVISION

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Pace-setters in the progress of  
industrial power transmission





A double pallet of brick delivered by truck to the basement of the building is placed in storage by a Clark fork truck. Pallets are placed on the elevator for delivery to upper floors as needed. C&E Staff Photos

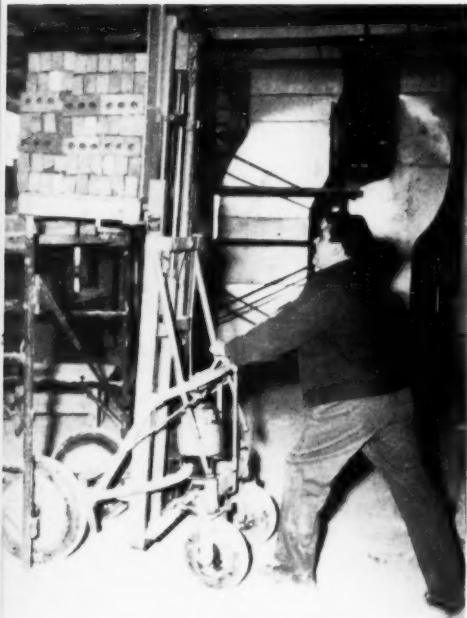
## Mechanical methods move masonry materials

*Machines handle palletized brick and tile from factory to bricklayer; two sizes of buggies shuttle material on upper floors of building*

Masonry material for the \$7 million City Hall and Court House building for Madison, Wis., is being handled entirely by mechanical means as it moves from manufacturer to bricklayer.

This swift material-handling system, being used by B. Perini & Sons, Inc., Framingham, Mass., depends on a number of standard and special machines that transport brick, glazed tile, mortar, and other items with a minimum of time and effort required by workmen.

Altogether, half a million pieces of glazed tile, 450,000 backing brick, 400,000 Darlington face brick, and 250,000 pieces of clay tile that will receive plaster, are going into the con-

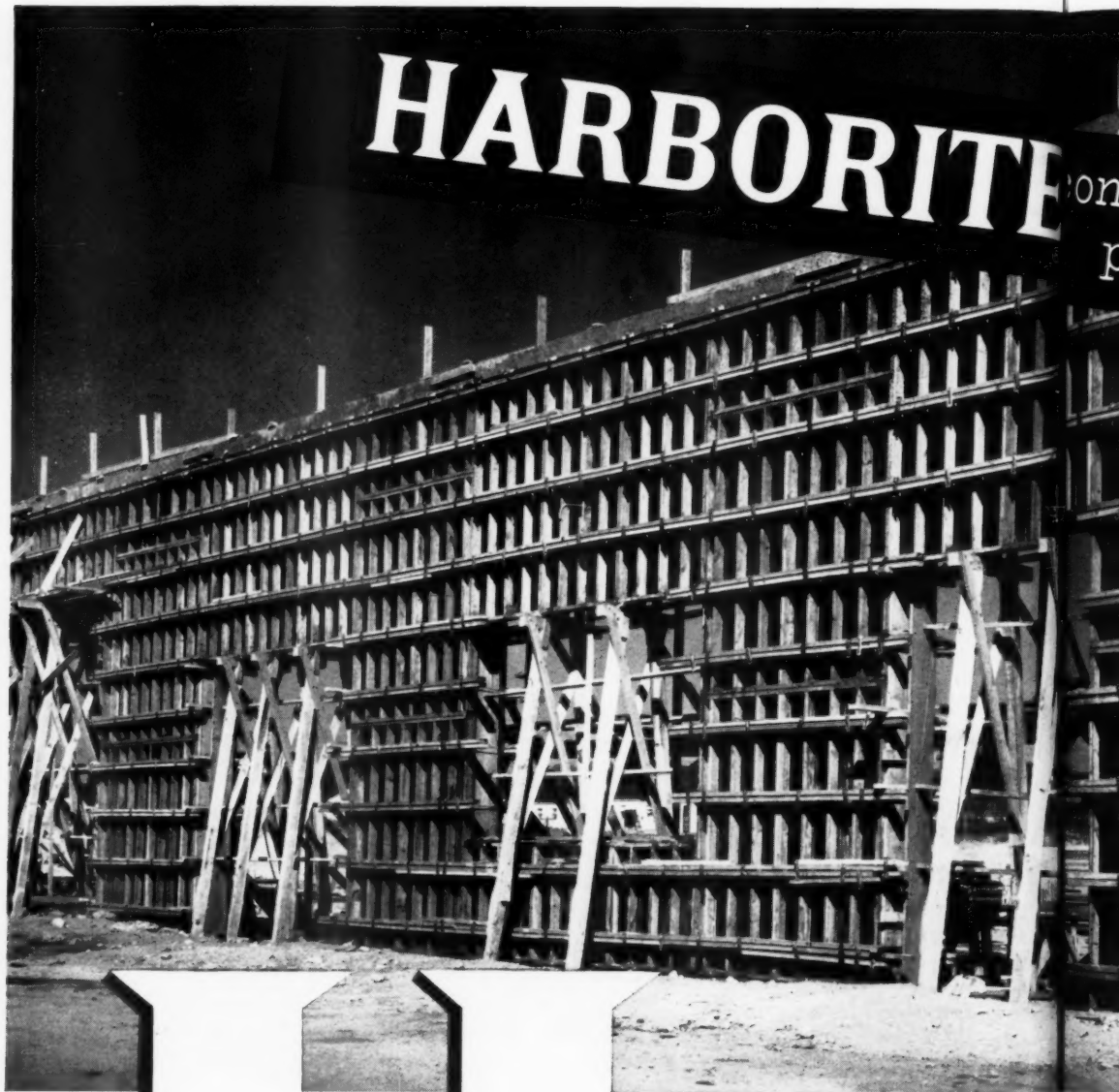


A small West Half Hi-Lift Brick Buggy brings the half, or small pallets, directly to a scaffold being used by bricklayers.

crete-encased steel-frame structure. A total of 1,080 cubic yards of mortar is required to place these materials. The stone exterior of the building, which will house government agencies of Dane County and the City of Madison, is being placed by a subcontractor.

### Pallets make job easy

The key to Perini's method is the use of a simple pallet on which brick



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CONTRACTORS AND ENGINEERS

and tile are carried. In this case, they are actually double pallets composed of two 16 x 24-inch pallets placed side by side, the adjacent legs banded together with a Signode steel strap. Each of the small pallets is a simple platform of 1-inch lumber or 3/4-inch plywood on 2 x 4 sills.

The contractor furnishes the 24 x 32-inch double pallets to the manufacturer so that brick and tile can be loaded on them for shipment. These materials are carefully placed on the pallets so that they do not overlap the joint between the two sections of the pallet.

#### Trucks drive into building

Large semitrailer delivery trucks, carrying the materials on pallets, drive into the basement of the build-

ing. The basement will eventually serve as a garage for vehicles of city and county governmental agencies occupying the structure, and its availability during construction provides an ideal material-handling area.

In the basement, a Clark fork truck unloads the pallets from the delivery trucks and stacks the materials in a storage area until they are needed. Cement for the mortar, purchased in carload lots, is also delivered to the basement on pallets by the cars. Sand is delivered by trucks and dumped on the basement floor near the mortar mixer.

The mixer is a CMC 7-cubic-yard unit powered by a Le Roi water-cooled engine. A 6-foot Wonder mixer with a Wisconsin engine stands by for use in emergencies. Both sand and cement



The wide-spaced rubber-tire wheels of the West Brick Buggy straddle a double pallet to be delivered to workmen.

for the mortar are charged into the mixer directly from the point where they are unloaded from delivery trucks, and no rehandling is necessary.

The CMC mixer is located near the Archer tower elevator, which has been set up in a shaft that will be used by one of the permanent elevators. The lift, serving all eight floors of the building, is operated by an American hoist powered by a Minneapolis-Moline engine.

Getting the brick, tile, and mortar from the basement to the workmen on the upper floors is the most important part of the operation. Here, a group of special machines made by the West Brick Buggy Corp., Cleveland, Ohio, play a major role.

#### Buggies handle brick

When pallets of brick and tile have been picked up in the storage area by the Clark fork truck, and placed on the elevator, they are whisked to the floor where they are needed. The elevator stops at the designated floor, and the pallets are picked off by a West Brick Buggy and wheeled by hand directly to bricklayers or to temporary storage.

The brick buggy is a miniature,  
(Concluded on next page)



On one of the upper floors, a workman separates a double pallet into two single pallets by breaking the Signode steel strap that binds the legs of the unit.



...cost less  
than a penny  
per poured  
surface foot!

### HIGH RE-USE FACTOR MAKES THIS MIRACLE OVERLAID FIR PLYWOOD YOUR IDEAL MATERIAL...

Forty re-uses—not unusual for Harborite—will cut your cost to less than 1¢ per poured surface foot... and contractors have reported over 100 re-uses for forms made of Harborite! Rigid, abrasion-resistant Harborite panels produce glass-smooth concrete... joints and fins are cut to a minimum... stripping is easier, faster! The super-smooth Harborite overlay will not run, bleed or discolor concrete... it has a special affinity for oil and other form finishes. Available in oversize panels and standard 4' x 8' size... in any thickness.

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MIRROR-SMOOTH SURFACES...  
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WAREHOUSE COST PER FOOT*	\$ .242	\$ .308	
AVERAGE NUMBER OF RE-USES	10	40	
COST PER POURED SURFACE FOOT	\$ .0242	\$ .0077	

\*Prices vary in different areas.

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 226





West rubber-tire buggies, loaded in the basement and hoisted by elevator to an upper floor, are wheeled easily over the concrete sub-floor to the bricklayers.

(Continued from preceding page)

hand-operated fork truck, made in two sizes to match either the single or double pallets. It has a hand hydraulic lift used to pick up pallets or set them down. And it is equipped with rubber tires so that it can roll easily on the concrete subfloors of the building.

Usually, the large-size buggy handles pallets from elevator to temporary storage on upper floors. When materials are to be delivered to bricklayers, the band between the two half-

pallets is cut and a Half Brick Buggy takes the small pallet directly to the bricklayers.

When masons are working close to the floor, the pallets are set on the floor within easy reach of the workmen. As the work goes to higher levels and scaffolds are needed, a special buggy with a high lift sets the pallets directly on the scaffold. To demonstrate the speed with which materials can be handled by this method, the contractor moved 20,000 bricks from the basement storage area to the third floor—a lift of four floors—in three hours.

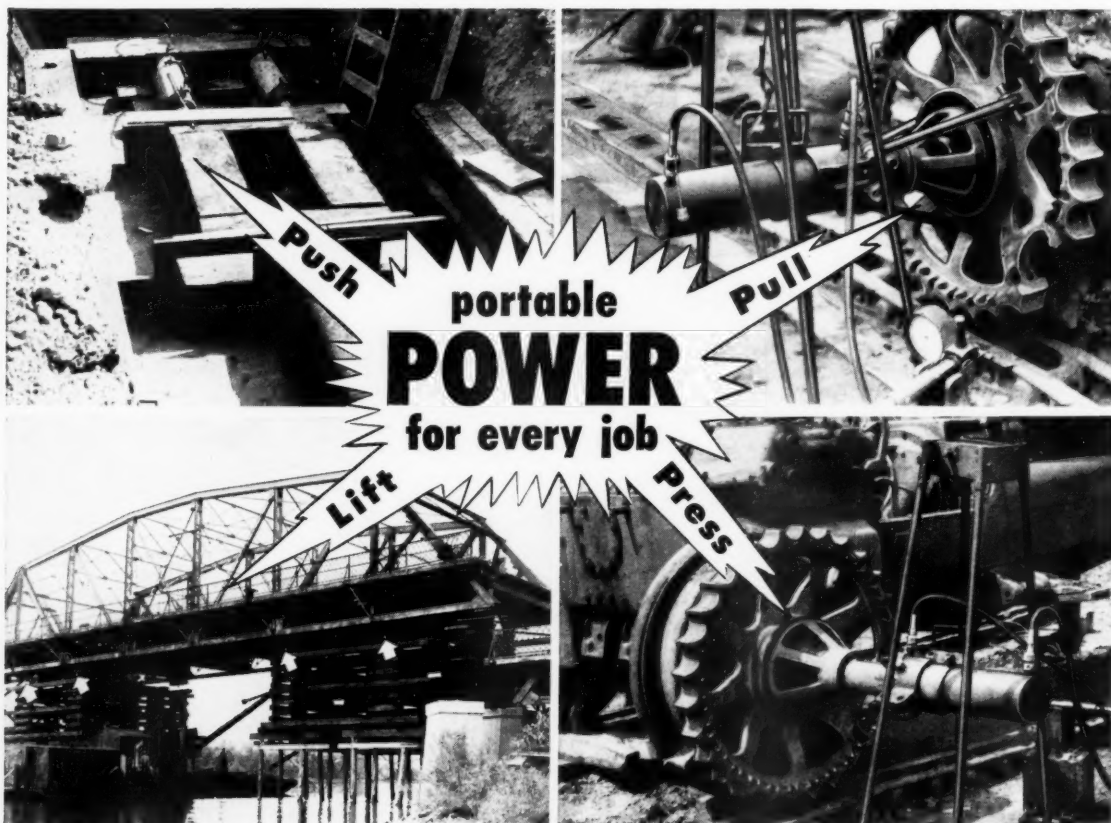
#### Buggies also handle mortar

The mortar is dumped from the mixers in the basement into West Mortar Buggies, rectangular metal boxes with a capacity of about 3 cubic feet. The buggies are mounted on rubber tires so that they can be easily moved by a workman. Full buggies are rolled onto the elevator platform, hoisted to the desired floor, and pushed by hand to the masonry crews. A workman shovels the mortar from the buggy to the mortar board, which is located either on the ground or on the scaffold.

Brick and tile are laid in the conventional manner. But there are no delays in this work, since much less time and labor are consumed in handling the materials from the time they arrive on the job until they are in the hands of the bricklayers.

The masonry superintendent for B. Perini & Sons, John Ablondi, planned the layout and the methods of operation for this project and is supervising the actual masonry construction operations. The general superintendent for the project is J. R. Johnson.

THE END



### whatever your job...do it better with

When you need hundreds of tons of sheer power... power to push pipe or pull wheels, lift bridges or press sprockets... You've got it with Rodgers Hydraulic Jacking Units that deliver power in 4 dimensions!

**EVERY JOB GOES FASTER, EASIER**, at lower cost when Rodgers Jacking Units step in with their steady, precisely controlled power. Single and double acting jacking cylinders in capacities from 50 to 600 tons are available—ram travels from 6 to 48 inches are standard—up to 72 inches optional.

**FOR THE REALLY BIG JOBS**—like bridge raising—multiple jack installations, working from a single pump and control, deliver uniform power at all jacking stations.

Rodgers Jacking Units—cylinders, hoses, couplers, pumps and controls—are also offered with special attachments for tractor service and tunnel shield work.

**PROMPT DELIVERY** of Rodgers Hydraulic Jacking Units is usually possible from regional distributors or the factory.



## Rodgers Hydraulic Inc.

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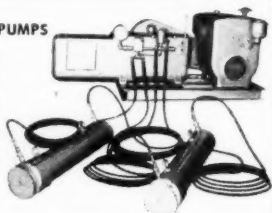
#### TWO FREE CATALOGS

New Bulletin 321C describes Rodgers Portable Service Jacks for all mechanical pulling and pressing operations. Bulletin 317A describes Rodgers Jacking Units and accessories for construction jobs plus facts on typical jacking applications—send for both right away!

# RODGERS HYDRAULIC JACKS

#### POWER DRIVEN HYDRAULIC PUMPS

are available with either Wisconsin air cooled engines or electric motors. They produce 2.5 GPM at zero working pressure with a normal working range of 6,000 PSI and will attain momentary peak pressures of 10,000 PSI.



#### HAND OPERATED PUMPS

have three working pump speeds—first, 13 cubic inches per stroke at 3,000 PSI; second, 8.6 cubic inches per stroke at 5,000 PSI; third, .44 cubic inches per stroke at 10,000 PSI.



### LeTourneau-Westinghouse personnel news

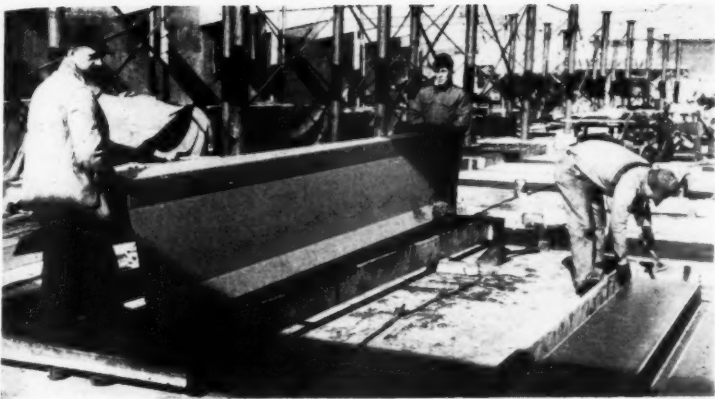
A series of new appointments has been made by LeTourneau-Westinghouse Co., Peoria, Ill. Jack G. Errion, the new assistant to the domestic sales manager, will not only direct the company's sales training program but also will assist W. E. Hendricks, domestic sales manager.

Kenneth W. Chriswell has been made assistant advertising manager for the company, and David R. Harvey has been appointed sales promotion supervisor. Leland B. Adams will direct the company's export advertising program, and Dean A. Frost will serve as supervisor of trade publicity.

### Stulz-Sickles to expand

A new building, scheduled for completion in September, will triple the plant and office space of Stulz-Sickles Co., Newark, N. J., producer of manganese-nickel steel. Located in Elizabeth, N. J., the new facility will be built on a two-acre site on Route 1.

CONTRACTORS AND ENGINEERS



### Fiberboard forms save precasting labor costs

■ The use of its corrugated fiberboard as disposable, one-time forms in the precasting of concrete slabs, is recommended by the Inland Container Corp. The company points out that its product brought about a labor saving of 66 per cent in the precasting of building sections for a 25,000-square-foot, one-story, fireproof building in Crawfordsville, Ind.

The corrugated fiberboard is especially recommended when the design of the precast panels is of a type that would require complex forming. The forms can be manufactured to exact specifications at the factory and delivered to the job ready to be set in place by unskilled workmen.

The fiberboard possesses the additional advantages of being easy to handle because of its light weight and its minimum storage-space requirements, the manufacturer points out. Stripping time for the Crawfordsville job, which involved reinforced roof sections measuring 18 x 4 feet, did not exceed 3 minutes per panel, according to the manufacturer.

For further information write to the Inland Container Corp., 700 W. Morris St., Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 117.

### New mixer line offers 21 different models

■ The new Essick mixer line offers 21 different models in the four basic sizes with 4, 6, 8, and 12-cubic-foot batch capacities. The new mixers all feature added horsepower, faster spiral mixing action, no greasing, improved shaft seals, easily accessible engine houses, bag splitters, safe portability, heavy-duty clutch, low charging heights, and rubber scraper blades, according to the manufacturer.

In addition, the 8 and 12-foot mixers employ an enclosed automotive-type transmission and clutch directly coupled to the engine or motor with all gears machine-cut and running in oil.

For indoor mixing operations, the manufacturer recommends the Essick electric-powered Thru-A-Door models. On these models, the mixer wheels can be telescoped in to allow the mixer to pass through doorways and then returned to the wide safe highway travel width.

For further information write to the Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles, Calif., or use the card at page 18. Circle No. 131.

Workmen set inland corrugated fiberboard forms in place. The forms are especially recommended when the design of the precast slabs necessitates complex forming.

The new Bendix power brake is easily installed under the hood of any light truck.

### Introduce power brake for light-duty trucks

■ A new, easily-installed power brake for light trucks has been introduced by the Bendix Products Division of Bendix Aviation Corp.

The Bendix power brake is adaptable for all  $\frac{1}{2}$ ,  $\frac{3}{4}$ , and 1-ton trucks, and is available in models especially designed for GMC, Chevrolet, Dodge, International, and Ford trucks.

In all models, the power brake is installed under the hood. Because preformed, prefabricated all-steel tubing has been used in the device, installa-

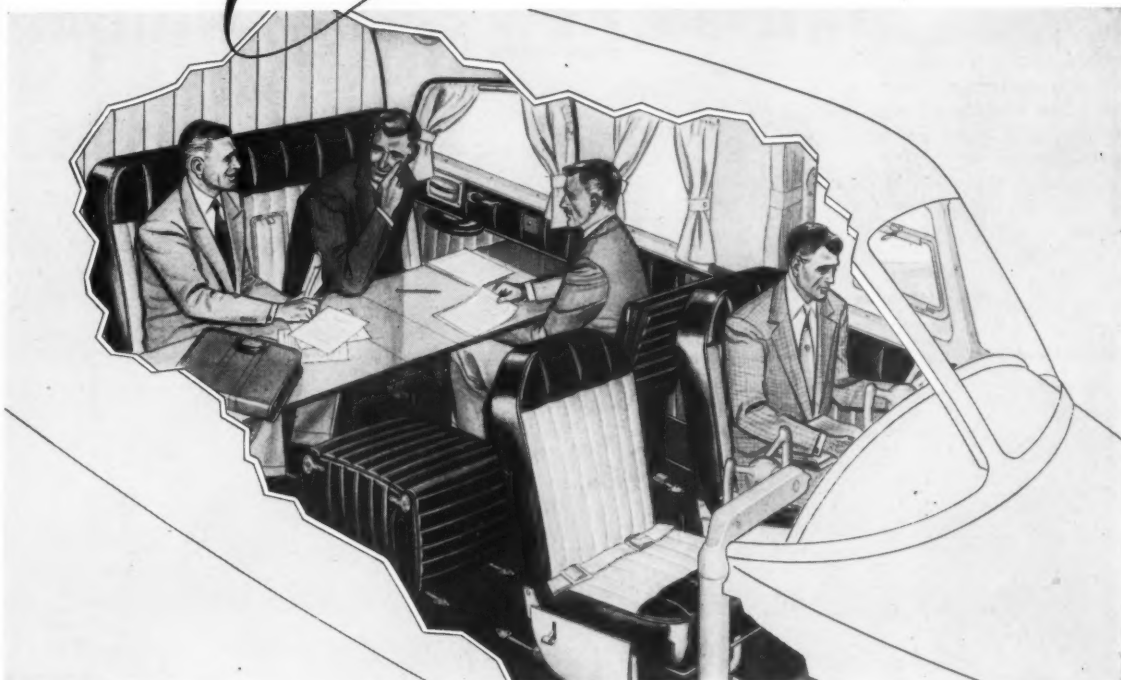


tion is said to be greatly simplified. A mechanic may install the brake on any light truck in less than 45 minutes, according to the manufacturer.

For further information write to the Bendix Products Division, Bendix Aviation Corp., 401 N. Bendix Drive, South Bend 20, Ind., or use the Request Card at page 18. Circle No. 127.

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## "Room To Be Comfortable"

Flexibility and Utility in both great Commanders are made possible by the long, roomy cabin. Ample space is provided for such optional accessories as the multiple use hassock seats and tuck-away conference tables.



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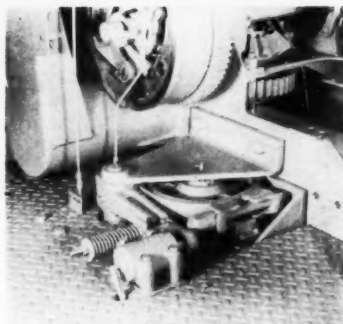
For more facts, use Reader-Reply Card opposite page 18 and circle No. 228



### Friction-type swing brake available on crane line

■ Availability of a friction-type swing brake on all its shovel-crane has been announced by the Link-Belt Speeder Corp. The complete Link-Belt Speeder line of crawler and rubber-tire shovel-crane, in 1/2 to 3-yard digging capacities and 12 1/2 to 35-ton lifting capacities, now has the hydraulic control swing brake feature as optional equipment.

For use in lifting crane operations calling for precision spotting of loads, the hydraulic control swing brake allows the operator to hold the boom of all Link-Belt Speeder shovel-crane in any desired position by fingertip control. Braking effort is hydraulically applied—through



A hydraulically controlled swing brake is now available on the complete Link-Belt Speeder line of crawler and shovel-crane.

Speed-o-Matic power hydraulic controls—and is spring-released.

Another feature is the application

of the patented Link-Belt Speeder Speed-o-Trol, the friction throttle-type control which actuates a variable-pressure hydraulic valve. The combination allows the operator to provide any amount of drag required to reduce drifting of the boom in high winds or on an incline, or to set the brake fully and still have both hands and feet free to operate other levers.

For further information write to the Link-Belt Speeder Corp., 1201 Sixth St. S. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 85.

### Hydraulic hammer

■ A mobile hydraulic hammer that will break concrete pavement; cut asphalt; compact sand, gravel, or

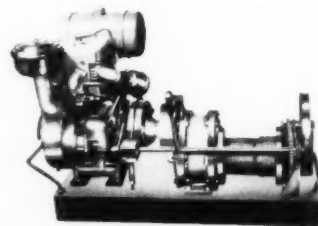
rock; drive posts and piling; and stabilize subgrade and shoulders on highways is featured in a folder from Arrow Mfg. Co. The condensed specification chart states that the over-all working height of the unit is 14 feet 3 inches; and the hammer has a controllable work force up to 8,000 foot-pounds.

To obtain this folder write to Arrow Mfg. Co., P. O. Box 4120, South Denver Station, Denver 9, Colo., or use the Request Card at page 18. Circle No. 134.

### New power hoist units are electric, gas-driven

■ Newly added to the Sasgen line of power hoists is the Power Puller winch for operating cranes, booms, derricks, material elevators, draglines, and other contractor's equipment.

Sasgen Power Pullers are available in 16 models with load capacities of from 500 to 2,000 pounds and ratings of from 3/4 to 7 1/2 hp. The two largest, rated at 6 and 7 1/2 hp, are gasoline-engine-powered; the rest are electric, 115 to 440 volts. A lever control permits reversing action on the electric units and serves as a positive mechanical brake on all models.



The Sasgen Power Puller winch is available in 16 models with capacities of from 500 to 2,000 pounds.

The reduction unit of each model reportedly is geared to deliver high torque and horsepower. The double reduction spur gears of high-tensile steel are driven by a high-torque, repulsion-induction-type motor through a shock-absorbing flexible coupling. The gears run in a continuous oil bath and all shafts are ball-bearing-mounted.

For further information write to Sasgen Derrick Co., Dept. CON, 3101 W. Grand Ave., Chicago 22, Ill., or use the Request Card at page 18. Circle No. 91.

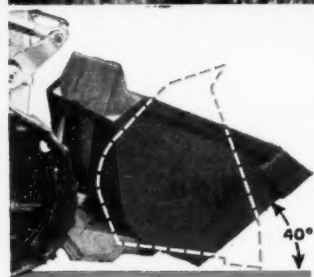
### Wheelbarrows, buggies

■ Various models of wheelbarrows and buggies to handle mortar, cement, brick, block, and tile are featured in a catalog from West Brick Buggy Corp. Also shown are a standardized pallet, which is said to carry an amount equal to four wheelbarrow loads; hydraulic front-end lifts for raising men and materials as high as 26 feet; and sectional and suspended scaffolding. Brief descriptions, job photos, and specifications are given for each model.

To obtain the catalog write to West Brick Buggy Corp., 4310 Mayfield Road, Cleveland 21, Ohio, or use the Request Card at page 18. Circle No. 142.

**NOW . . . a loader which combines crawler traction with rubber-tired speed . . . a loader with unmatched visibility plus perfect balance**

## the all new International® Rear-engine Payloader®



**Tremendous pry-out force** is obtained by using breakout pads on ground as fulcrum for leverage. Load forces transfer to ground instead of to machine.

**40° bucket tip-back** at ground level permits digging of bigger bucket loads, plus retaining of more of load in bucket during lifting and carrying.

For speed, maneuverability, and big capacity in a crawler-loader, see the new International 1 3/4 yard Model 12 Payloader!

This amazing 77 net hp machine seats its operator in front of the engine, close to the bucket, where he can always see what he's loading, and where he's going. It balances the tractor between rear-mounted engine and front-mounted bucket. It distributes weight evenly over entire length of tracks, to give you better traction, longer track life, better stability on grades, less bogging down in spongy ground.

Your operator moves faster on the

new Payloader, too. He can go up to 10 mph forward, 13 mph reverse. He changes speeds or direction rapidly through a full-power shift, three-speed, full-reversing transmission. He need hardly slow down or reduce engine power to shift gears. He gets maximum digging power from the machine's torque converter. And he steers easily, too, controlling each steering clutch and brake through one power-boosted lever (no foot steering brakes).

Try this new International Model 12 Payloader for yourself. Let us arrange a demonstration. Call soon! A good deal awaits you!

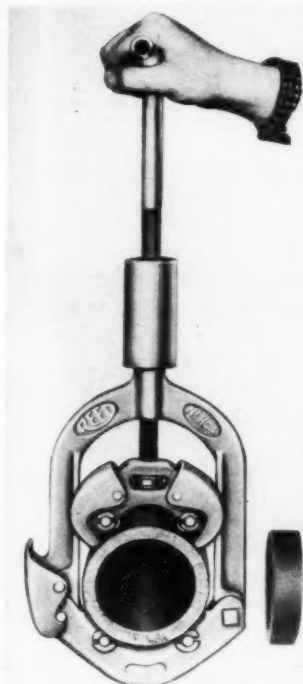
See you at the  
ROAD SHOW  
CHICAGO  
Jan. 28-  
Feb. 2, 1957



## International® Construction Equipment

International Harvester Company, 180 North Michigan Avenue, Chicago 1, Illinois  
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 245



The Reed four-wheel hinged cutter for acid-resisting pipe.

### New four-wheel cutter for acid-resistant pipe

■ A new four-wheel hinged cutter designed especially for use on Duriron acid-resistant pipe is being offered by the Reed Mfg. Co. Available in five capacities to cover the range from 1½ to 12-inch pipe, the new Reed cutter is said to insure clean, right-angle cuts as close as 1½ inches to the end without cracking the brittle pipe. Extreme speed is also a feature since 4-inch diameters of the high-silicon iron pipe can be cut in less than a minute.

Using the same basic design as the Reed hinged cutter for conventional steel and cast iron pipe, the new tool incorporates special nickel-chrome-alloy cutting wheels and an exclusive constant-pressure feature. This feature maintains a uniform cutting force even when the pipe is out-of-round or when raised numbers or letters are encountered on the outside of the pipe, according to the company.

The hinged frame and four-wheel design reportedly also simplify close-quarter cutting of pipe in the line, since the tool operates with only slightly more than a quarter-circle swing of the handle.

For further information write to the Reed Mfg. Co., 1425 W. 8th St., Erie, Pa., or use the Request Card at page 18. Circle No. 154.

### Asphalt pavement seal

■ Jennite J-16, a surface seal for asphalt pavements, is described in a folder from Maintenance, Inc. According to the literature, Jennite stops the destructive effects of gasoline and oil, seals out frost, eliminates crumbling, and retards the drying action of the sun. Application methods and engineering service data are included.

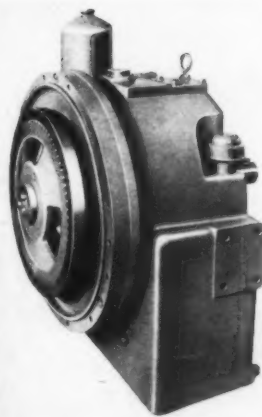
To obtain Form LL-2992 write to Maintenance, Inc., Spruce St., Wooster, Ohio, or use the Request Card at page 18. Circle No. 53.

Four models of the Twin Disc Clutch Co.'s new single-stage torque converters are now available in torque ratings up to 330 foot-pounds.

### Single-stage units added to torque converter line

■ A new line of single-stage torque converters has been announced by the Twin Disc Clutch Co.'s Hydraulic Division. Addition of the new units complements the manufacturer's line of three-stage torque converters and fluid coupling drives.

The units currently available in the 1500 series are for engines producing



from 30 horsepower at 1,150 rpm to 198 horsepower at 2,400 rpm. Specific torque ratings are 165, 200, 240, 285, and 330 foot-pounds, depending on the impeller blading selected by the user.

Twin Disc's initial group of single-stage units includes four models: Model C with clutch input, Model S with spider-drive input, the spacer-type Model S with a double-ended SAE housing, and Model U with flange input and output.

For further information write to the Twin Disc Clutch Co., Hydraulic Division, Rockford, Ill., or use the Request Card at page 18. Circle No. 146.



## At 3 P.M. CAVE-IN!

Cave-ins will happen, and through no fault of the contractor. On this excavation job there was erratic soil behavior, shifting loads, rain saturating... everything unpredictable.

When the cave-in happened—L. B. Foster Company was called at 3 o'clock in the afternoon for rental steel-sheet piling in a rush. We cut the needed lengths of MP-116 piling in our yard, loaded it on Foster trucks, and made delivery on the job site 400 miles away before the crews were on the job the next morning.

This is typical of the dependable help contractors all over the country can expect... and are getting... when they use the Foster Piling Rental Plan. Always the exact length and exact section... when you need it... on low fixed cost. Call or write your nearest Foster office for quotations on your temporary piling needs. Find out for yourself the real savings in renting from Foster.

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Rails, Pipe & Fabrication





Powered by a Caterpillar D13000 engine, a Buckeye Model 48 trencher walks through the wet fields, leaving straight, wide trenches. Track mounting provides good flotation. *C&E Staff Photos*



This Cleveland Model 320 trencher, also powered by a Caterpillar engine, advances through muddy terrain at a fast pace. Trenchers slowed down when they had to excavate drilled and blasted rock.

## Crews fight rain and mud to install gas pipeline

**Equipment operates on muddy, rocky Oklahoma terrain to lay 26-inch gas line; sand poses problem for dozers**

by RALPH MONSON, field editor



A Cat tractor equipped with a 35-foot Carco side boom strings the pipe along the right-of-way. This operation was sublet to Percy Jones, Inc. In the background, excavation for crossing a rural road is being started by a backhoe.

Construction of a 93-mile cross-country gas pipeline in northern Oklahoma got under way at a time when heavy intermittent rain had halted just about every other crew in the area. Maybe the men on this job had seen so much dry weather that they enjoyed the rain; maybe they were too interested in getting the job done to notice the wet conditions; but whatever the reason, the crews of R. H. Fulton & Co., Lubbock, Texas, dug trenches, strung and assembled pipe, and welded joints as though they worked in slippery, soggy fields like these every day.

### Fabrication yard

Owned by Cities Service Gas Co., Oklahoma City, Okla., the \$4.5 million facility is a 26-inch natural-gas line running from Blackwell, Okla., to Independence, Kans. Materials and equipment for the job arrived at the Blackwell end, where a storage and fabrication yard was set up at a Cities Service pumping station that forms the start of the line on the outskirts of the city. Here, valves and other special fittings and appurtenances were assembled and prepared for installation in the line.

The right-of-way crew started clearing and grading the area with Caterpillar D8 tractor-dozers. The first 20 miles of line, from Blackwell to the Arkansas River, traversed

CONTRACTORS AND ENGINEERS

relatively level, fertile farming country where little clearing work was needed. Consequently, the right-of-way crew was soon miles ahead, where it encountered tough conditions that tested the ruggedness of the machines and the skill of their operators.

One of the first big jobs for this crew was backfilling a huge sand trench on the east bank of the Arkansas River. Pipe for the river crossing had been installed by another crew. At the site where pipe emerged from the river and started up the bank, sand had been excavated from a big trench and piled into a series of veritable mountains on either side.

Six D8 tractor-dozers bit into the mountains of sand and started pushing them into the trench. At first it looked like a hopeless task; but within a few days, the piles had begun to disappear. In less than a week the region was once again a flat area of river-bottom land.

The dozers then swung into the rocky wooded hills to the northeast where they met their real challenge. In addition to such routine jobs as clearing and grubbing trees, crews had to grade rock ridges so that the trenching and pipe equipment could get through and build roads through rugged country.

An Imco Kelley ripper mounted on the rear of one of the tractors tore away enough rock to make a road for the rest of the equipment. This heavy-duty hydraulically-operated attachment was usually used with only one of the big teeth, even though there were spaces for three. A Hyster winch and a long cable carried on the rear of another tractor also worked in the same area.

#### Ditch crew works in rain

The rains began about the time the ditch crew was starting out of the Blackwell yard; but they caused little delay since the subgrade for trenching was dry and the track mountings provided good flotation for the trenchers. Two of these trenchers, a Buckeye Model 48, powered by a Caterpillar D13000 engine, and a Cleveland Model 320, also powered by a Caterpillar engine, walked across the soggy countryside leaving straight, wide, neatly-tapered trenches and the continuous spoil banks.

Although the workmen skillfully diverted most of the water away from the trenches, they were not entirely successful. Occasionally some of the flowing or standing water broke into the trench, transforming it into a watercourse with full-scale flooding at the next low point. However, the crews that followed were well equipped with pumps, and the extra water delayed them only a little.

In addition to the two trenching machines, the ditch crew used six backhoes, two of them Bucyrus-Erie

(Continued on next page)



A Cinch hydraulic bender fits the pipe to the line and grade of the trench. The pipe is cradled by a Caterpillar D7 tractor with Trackson pipelayer side boom and as bends are completed, the D7 tows the bender to the next position.



As a Cat D6 with Trackson side boom holds the 40-foot pipe sections, a Cruse internal clamp aligns the ends so that sections can be welded. Behind the tractor is an International TD-14 that pulls the welding generator trailer.



The Lincoln 300-amp welding generators, mounted on sleds, are pulled into position by a Caterpillar D4 tractor. The sleds moved easily through the mud and heavy going.





An Imco Kelley ripper attached to the rear of a Caterpillar D8 tractor-loosens rock in building a road to the right-of-way. The hydraulically-operated ripper was used with only one tooth for this operation.

(Continued from preceding page)

22-B's. These rigs installed road crossings and handled a major portion of the rock excavation on the rough section north and east of the Arkansas River. Crossings under railroads and under main highways were excavated by a Crose auger-type boring machine handled by a Caterpillar D7 tractor with Trackson side boom.

When the ditch crew began to hit rock, it brought in five Gardner-Denver 600-cfm compressors to operate Gardner-Denver wagon drills mounted on the front of D6 and D7 tractors. The drilled and blasted rock was excavated by the trenchers and hoes.

#### Stringing the pipe

While the water and mud did not

seem to slow up the ditch crew too much, they certainly made it rough for Percy Jones, Inc., the subcontractor on pipe stringing. The pipe for the entire job was received by rail at Grainola, Okla., Peru, Wayside, and Arkansas City, Kans., where it was stored in yards until it was trucked out to the line. Using six Chevrolet, White, and GMC trucks pulling Hobbs tandem pole trailers, Jones hauled six of the 40-foot joints of 26-inch pipe per load.

An International boom truck loaded the pipe in the yard, and the trucks hauled over state highways and county and local roads to the closest intersection with the pipeline right-of-way. Up to this point, the trucks had relatively easy going even though the local roads were occasionally rutted and muddy. But when they left the road and started across the muddy fields, normal trucking operations ceased.

As the truck left the highway, it was attached by a tow cable to an International TD-18 tractor and literally skidded to the unloading point. While the truck driver tried to keep the wheels rolling and did some steering, tires slid through the mud like runners more readily than the mud-encased wheels turned. The pipe joints were picked off the trucks and strung along the trench end to end by a Cat 50 tractor with a 35-foot Carco loading boom.

Loaded and unloaded trucks were almost equally helpless since they couldn't develop any traction in the mud. So the TD-18 hooked its cable to the rear of the trailer and snaked the rig back onto the road. It was slow work but it kept the rest of the crews moving.

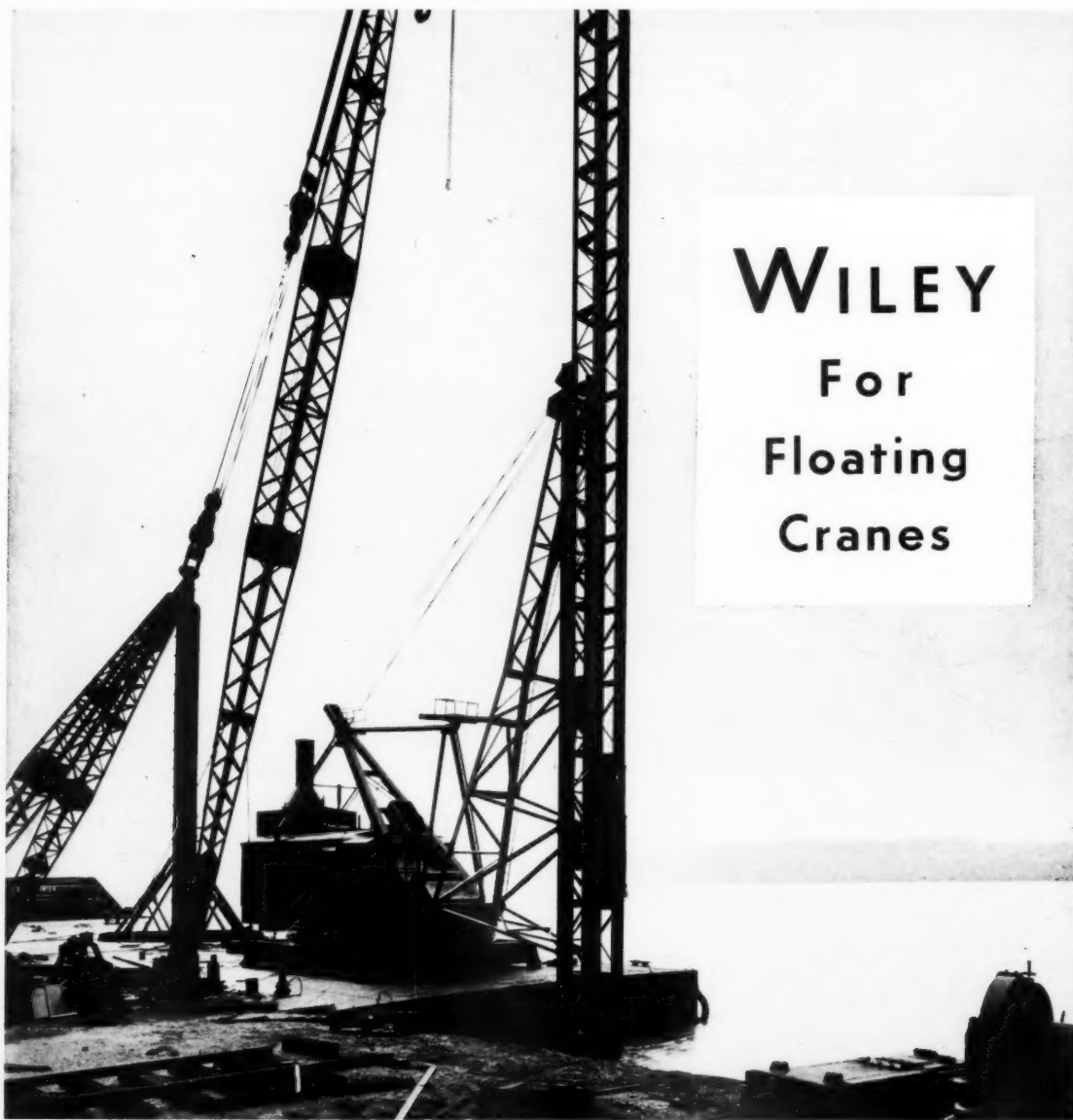
#### Assembling the pipe

Before the pipe joints were assembled into long continuous sections, some of them had to be bent to fit the contour and alignment of the trench. Using a Cinch hydraulic bender, fed by a Caterpillar D7 tractor with Trackson side boom, the bending crew quickly and easily shaped the pipe to fit the trench. Then as the bends at a given point were completed, the D7 hooked onto the bender and towed it to the next position.

To be sure that the ends of each joint were clean and ready for the welders, a workman went over each one with a Sioux buffer and a wire brush. Power for the buffer was supplied by a Kohler light plant carried in a Ford pickup, which waded through plenty of mud with only an occasional lift from one of the tractors.

The Caterpillar D6 setup tractor picked up each joint of pipe in turn and held it in place against the next joint. A Crose internal lineup clamp brought the two edges into perfect alignment, and three welders made the tack welds. While this was being done, other workmen had built up a crib of 4x4 timbers to support the pipe in a position parallel with the grade of the trench. The setup tractor then lowered the pipe onto these cribs and went on to the next joint.

The final operation by the pipe crew



## WILEY For Floating Cranes

Wiley Floating Pile Driving Unit, a full circle pile driving unit, constructed to handle vertical or battered piles over the end of the barge or over the side. Two units of this type owned and operated by the Frederick Snare Corporation. For dependable floating equipment, discuss your requirements with Wiley Engineers.

**WILEY** MANUFACTURING COMPANY  
BARIUM STEEL CORPORATION SUBSIDIARY

P.O. BOX 97, PORT DEPOSIT, MARYLAND

PHONE: PORT DEPOSIT DRAKE 5-2111

For more facts, use Reader-Reply Card opposite page 18 and circle No. 230

Six dozer-equipped Caterpillar D8's backfill an excavation at the edge of the Arkansas River where the line crossed the river. The sand had been piled on either side of the right-of-way before the line was laid.



was adding another bead to the welded joint. This hot pass head was made by a second crew of welders that, like the first, used three Lincoln 300-amp welding generators powered by GM diesel engines. Each group of three Lincoln generators was mounted on a crawler wagon pulled by either an International TD-14 or a Caterpillar D4 tractor. An H & M beveling machine, also carried on one of the track trailers, cut pipe to specific lengths and also cut off the damaged ends of the pipes.

Never far behind was the welding crew with its six GM-powered Lincoln welding generators, each mounted on a separate pipe sled. A Caterpillar D4 tractor shuttled the sleds from joint to joint as the welding was completed. The pipe runners slid almost effortlessly through the wet grass and mud, and nothing short of actual downpours seemed to hinder the welders.

#### Delay coating and wrapping

Coating and wrapping operations could not be done while the pipe was wet, so these operations were delayed until the weather cleared. Cleaning and priming the pipe were done by a Crose cleaning and priming machine, and a Crose coating and wrapping machine applied coal-tar enamel and Fiberglas wrapping.

Priming and coating enamels were carried and heated in six Crose-Littleford dope kettles with a capacity of 23 barrels each, and two Caterpillar D8 pipelayers cradled for the priming and coating operations.

As the weather cleared and the ground dried, the coated pipe was rapidly laid in the trench and the long sections tied together into a continuous tube. A Bucyrus-Erie 15-B dragline equipped with a backfill bucket pulled the spoil banks back in over the pipe to complete the installation.

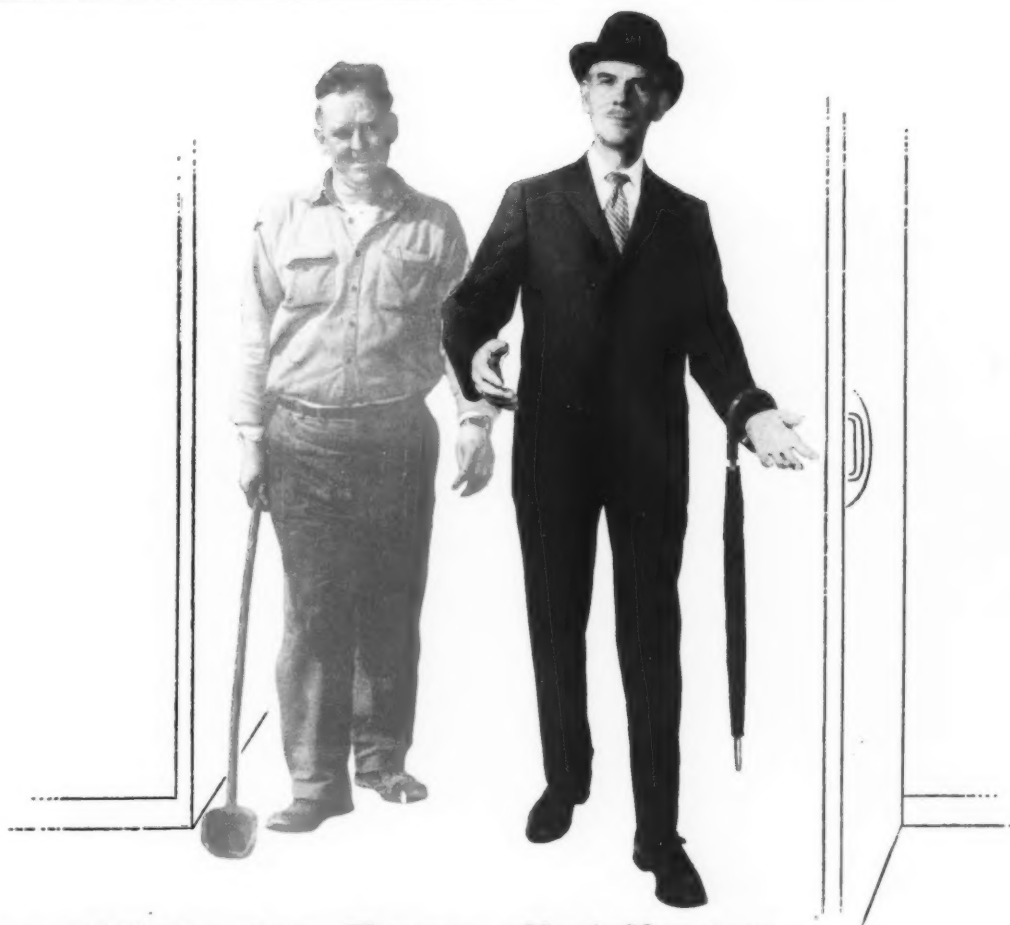
Superintendent Jim McGill of R. H. Fulton Co., Inc., had a staff of veteran pipeliners directing his crews. Among them were Vernon Parker on right-of-way and Hank Hensley on ditches. Tex Eubanks supervised the bending, Ocey Awalt the pipe crews, and Whitey Harris was in charge of the welders. Gus Purdom headed the dope crew, Hack Blackburn directed pipe lowering, and Bill Fidler looked after the cleanup.

THE END

#### Concrete moisture control

■ Recording and non-recording Instant Moisture Control instruments are described in literature from the company. Both instruments measure the amount of water in batch plants. The non-recording unit is designed for operators who need no permanent record of moisture in aggregate. A typical installation photo of the recording unit points up the fact that a permanent record of aggregate moisture is provided by an inkless recorder.

To obtain the literature write to the Instant Moisture Control Division of Colorado Pre-Mix Concrete Co., 1021 W. Mississippi Ave., Denver, Colo., or use the Request Card at page 18. Circle No. 163.



## Your Wickwire Rope distributor and our steel melter... always at your service

This steel melter—at Wickwire's open hearths where wire rope steel is made—is with your Wickwire Rope Distributor every time he makes a call.

True, he's physically at the open hearth compounding steel with the sharp eye of an expert. But your Wickwire Distributor makes his call with the full assurance that the steel in Wickwire Rope has the right chemical content and grain size because it's always produced under rigidly controlled conditions by experts.

It's just one more reason why your Wickwire Rope Distributor knows he's got top-quality rope, slings and strand to sell ... and that these products will serve you well.



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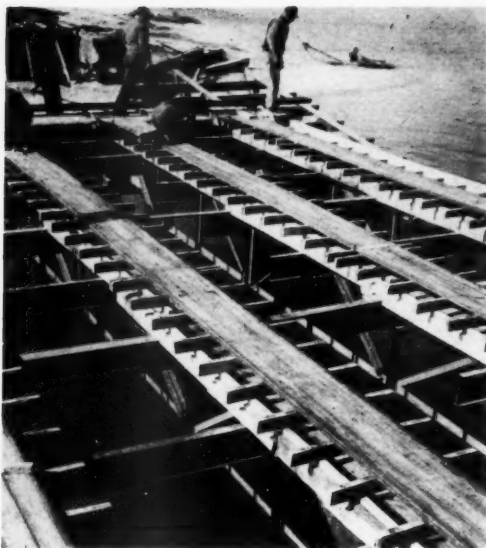
For more facts, use Reader-Reply Card opposite page 18 and circle No. 231



## Light steel trusses support concrete forms for bridge deck

Two pairs of trusses, each pair tied together with seven lightweight 10-foot-long I-beams, are set for each span. Hangers and brackets hooked around the pile caps hold the 37 x 3-foot-deep trusses in place.

C&E Staff Photos



(Additional photo on cover)

**Pairs of trusses hung from pile caps are disengaged by barge carrying falsework that works with the tides**

Fabricated, light steel trusses, used as falsework to support concrete deck forms, were placed between pile caps on adjacent bents of the Hilton Head Toll Bridge near Bluffton, S. C., then removed by timber falsework on a barge that worked with the tides after concrete had been placed.

This 3,320-foot-long span, completed recently under a \$850,000 contract by Wannamaker & Wells, Inc., Orangeburg, S. C., runs across two creeks and replaces the ferry service between the mainland and Hilton Head Island. The new facility consists of 54 spans—each 40 feet long—a 70-foot span across MacKay Creek, 21 spans—each also 40 feet long—and a 250-foot swing span across Skull Creek.

### Trusses used in pairs

Two pairs of trusses were used for each span length of decking. Each pair, tied together by seven lightweight 10-foot-long I-beams, were supported on the pile caps by means of hangers and brackets that hooked around the caps. Each truss, consisting of welded L-shaped steel sections, was about 36 inches deep and 37 feet long.

The four trusses making up the two pairs used for each span were spaced so that they were under the monolithically cast T-beams of the 6½-



Sam Braen confers with his Truck Superintendent, Fred Aldrich (seated in truck No. 80, foreground) and Bill Wilson, Asst. Truck Supt. (extreme right), at his Hawthorne, N. J. plant. The picture features some of Braen's new GMC W630 tandems with transit-mix bodies.

## "I've been buying GMC's since 1926 because they cost me less to use!"

—says Sam Braen of Sam Braen Industries,  
top New Jersey contractor with 132 GMC trucks on the road

EVER SINCE Sam Braen bought his first GMC—the same year he organized his firm—he's been coming back for more. Today, there are 132 of them in all—75 of them 59,000 GVW tandems equipped with 5½-yard concrete barrels.

They put in about 20,000 miles a year. That's modest—until you discover that a big percentage is rugged off-the-road work. And most of the highway travel is through heavy suburban traffic.

Yet this punishing daily diet goes easy on Braen trucks. Road failures are almost nonexistent. Down-times are few—and far between. And a truck

goes in for overhaul only after *two years* of hard service. Naturally, maintenance costs are way down.

So are fuel costs—in spite of all the traffic and traffic lights. In fact, Braen GMC's average *a mile a gallon better* than comparable trucks doing the same job!

Obviously, Sam Braen's preference for GMC's is strictly a dollars-and-cents proposition. And it's based on 30 consecutive years of experience.

If you'd like to know more about profitable performers like these—for any kind of truck-work up to 59,000 GVW—see your GMC dealer!

GMC TRUCK & COACH—A General Motors Division

For more facts, use Reader-Reply Card opposite page 18 and circle No. 232



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Do yourself a favor . . . Call us COLLECT—Temple 5-4477 . . . Ask for Sid Lieberman or Rich Medlock. We can offer you the best TRUE VALUE—Quality as well as Price.

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A recent statement made by one of the larger pipeline contractors: "I have purchased and inspected government surplus 6 x 6's at practically all of the surplus dealers. I can honestly say that I have gotten better service and value out of the processed 6 x 6's purchased from Zeligson."

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For more facts, circle No. 233

CONTRACTORS AND ENGINEERS

inch deck slab. As soon as both pairs had been securely fastened to the pile caps, the contractor began assembling the timber formwork on the connecting I-beams of each pair of trusses.

Each truss pair was placed between the pile caps by a barge-mounted crane. As soon as the deck pour had cured sufficiently, the contractor used a timber falsework on a barge to remove the trusses. This falsework, positioned under a pair of trusses just before high tide, made contact with the bottom flanges of the trusses as the tide came in. The end supporting hangers were then loosened, freeing the pair of trusses. As the tide went out, the barge slipped from beneath the decking and moved to another span requiring the trusses for a deck pour. In case of erratic tides, the falsework barge could be flooded so that the trusses could be moved quickly.

#### Precast piles for span

Each typical bent in the bridge consists of five precast concrete 18-inch octagonal piles, with the outside piles on a batter. A tower bent, consisting of two additional batter piles, was driven between every 12 spans of the bridge. Piles ranged in length from 40 to 80 feet, and were driven to a minimum 40-ton bearing through shale and muck into lime rock. The average penetration was 18 feet, and 3 feet into lime rock.

Piles were precast by the contractor in Orangeburg and transferred to barges for the 24-mile journey to the bridge site. All were precast with an 8-inch x 8-foot 42-pound H-section embedded at one end, 3 feet of which protruded from one end of the concrete tip. This H-section allowed the contractor to get the required 3-

(Concluded on next page)

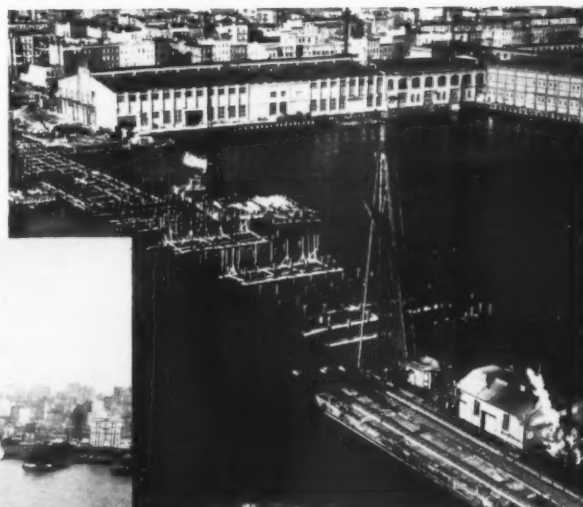
As soon as deck concrete has attained initial set, timber falsework is positioned under the pair of trusses. As the tide comes in, the falsework makes contact with the bottom flanges of the trusses and the end supporting hangers are loosened. The barge slips from under the bridge as the tide goes out.



## PORT OF NEW YORK'S NEWEST, WIDEST PIER

*rests on piles driven by*  
**McKIERNAN-TERRY HAMMERS**

Pier C at Hoboken, New Jersey, operated by the Port of New York Authority, and completed in March 1955, is 700 ft. long and 328 ft. wide; and rests on steel H-beam piles driven through dense, cohesive silt and sand to solid bedrock which is 140 ft. below mean low water at its offshore end



and 90 ft. below mean low water at the bulkhead line.

The contractor, J. Rich Steers of New York City, made sure that the many required piles would be driven without a hitch by using McKiernan-Terry Pile Hammers exclusively; and employed 11B3 Double-Acting Hammers and S8 and S10 Single-Acting Hammers for the purpose.

Write for bulletins explaining the many superior features of McKiernan-Terry pile-driving equipment.



Single-Acting  
Pile Hammer



11B3 Double-Acting  
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For more facts, circle No. 234

For more facts, use Reader-Reply Card opposite page 18 and circle No. 235





Precast concrete piles for land approaches are driven five to a bent by the crawler crane, left, handling a hammer in tower leads. The barge at right carries a batching and mixing plant that furnishes concrete for pile cap and deck pours.

(Continued from preceding page)

foot penetration into lime rock.

As soon as jetting had been completed by a 4-inch Jaeger pump, the piles were driven by a barge-mounted, steam-operated Marion crane that used an 85-foot boom to support the Vulcan No. 1 hammer. A Bucyrus-Erie 38-B, equipped with tower leads and a Vulcan No. 1 hammer, drove piles for the land approach spans.

After pile-driving had started, the contractor found that there were many variations in the lime rock strata, and many of the piles had to be built up after they were driven. This was time consuming, but since the piles were not tapered, simple forming techniques were enough to build up the tops of piles to the desired elevations.

As soon as piles had been driven for each bent, formwork, fabricated on the job, was built for the pile cap. The concrete for the cap, as well as for the deck, sidewalk, and handrails, was supplied by Jaeger 1/2-yard and Smith 1/2-yard mixers, both of which were mounted on one barge. A Lima crane, also mounted on the barge, used a 1/2-yard laydown bucket to place the concrete. Aggregates for the material, consisting of 1-inch-minus stone and sand, were furnished by a 400-ton material barge.

#### Superstructure steel

The 70-foot span in MacKay Creek, which has a 25-foot vertical clearance for limited navigation, consists of structural steel girders fabricated by Bethlehem Steel and erected by the contractor. Steel for the 250-foot swing span in Skull Creek was fabricated by American Bridge at Roanoke, Va., shipped by rail to Port Royal, then barged to the site. Riveting was required for this span, which provides two channels, each almost 100 feet wide. This job was subcontracted to Hanna Construction Co., Greenwood, S. C., which used a barge-mounted Bucyrus-Erie 38-B crane with a 70-foot boom and 18-foot jib for erection. The circular pivot pier that supports the span required 52 concrete piles and was built inside a cofferdam.

#### Personnel

F. B. Carson was the superintendent on this job for Wannamaker &

Wells, and J. B. Hill was the resident engineer for the South Carolina State Highway Department. The toll facility was built for the Hilton Head Bridge Authority, which was set up by the state and has John Sturgeon as chairman.

THE END

#### New Standard Oil manager

Earl F. McNeilly has been promoted to the post of sales manager of asphalt and heavy fuel oils for Standard Oil Co. (Indiana). A registered professional engineer in Illinois, McNeilly will make his headquarters in the firm's Chicago, Ill., general offices.

#### Paving-spreading unit gives good compaction

■ A new paving-spreading machine said to give compaction of up to 80 per cent of that achieved by large self-propelled pavers with mechanical tampers is announced by Littleford Bros., Inc.

A patented balancing beam, compaction chamber, and adjustable hinged screed permit 75 per cent of the unit's weight, plus the weight of the material, to be placed on the screed, according to the manufacturer. This weight of approximately three tons, brought to bear directly

## S-18 "EUC" SCRAPER

This new Euclid S-18 incorporates all of the advanced design features that have made "Euc" Scrapers the fastest growing line in the industry. With hydraulic lever action providing positive, independent control of bowl, apron and ejector, expense and down time for cable replacement is eliminated. Torqmatic Drive, NoSpin differential and rugged construction make the S-18 suitable for the toughest jobs and work with big pusher tractors. The low, wide scraper bowl, with adjustable 4-section cutting blade, assures efficient loading in any material. All major components are readily accessible . . . a feature that really pays off in more work-ability and low maintenance cost . . . one of the reasons why Euclids are your best investment.

**EUCLID DIVISION**  
GENERAL MOTORS CORPORATION  
Cleveland 17, Ohio



The tremendous power of the S-18 with independent control of all scraper operations and the low, wide bowl provided fast loading in the loose sand of this Wisconsin airport job. Euclid's four section cutting blade, with each section adjustable, reversible and identical, cuts maintenance cost and assures the most efficient loading in any material.

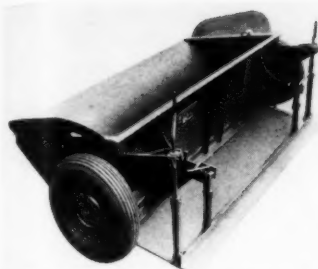
High apron lift and independent control of all scraper operations facilitates dumping big loads. On this air base grading work in Kansas, the fast dumping, traction and speed of the S-18 enabled the contractor to maintain high production at low cost. Short overhang of the engine gives better stability in rough going.



Maneuverability is exceptional in spite of the size and capacity of the S-18. The full hydraulic power steering and good hitch design permit non-stop turns in only 36'. Here an S-18 makes a quick turn after spreading its load on a highway relocation job in Wisconsin.



**Better Accessibility means More Work-ability**



The Littleford True-Lay paver-spreader.

on the compaction chamber and screed, reportedly produces a mat so compact and smooth that rolling can begin almost immediately.

Outstanding features of the new True-Lay paver-spreader are its pneumatic balancing wheels, chain-hitch attachment, and 16-inch hopper throat. Pneumatic-tire wheels act as an outrigger, floating over low areas or flexing when uneven grades are encountered. With the unit empty and the tongue inserted, the wheels are used to easily transport the machine from job to job.

The True-Lay's extra-large 16-inch-wide hopper throat is said to assure an even, smooth flow of dense material, tight mixes, or stone base without bridging or choking up. The True-Lay paver-spreader lays up to

100 tons of material per hour in a smooth, even, level mat from 4 to 8 feet in width and up to 6 inches deep.

For further information write to Littleford Bros., Inc., Box 97, 485 E. Pearl St., Cincinnati 2, Ohio, or use the Request Card at page 18. Circle No. 166.

#### Appointment by Flintkote

Ronald J. Mulligan has been appointed assistant product manager for the Insulrock Division of the Flintkote Co. He will make his headquarters at Flintkote's offices in East Rutherford, N. J.

#### Hand fastener drives through 1/4-inch steel

■ A multipurpose, manually-powered fastening tool that can seat a variety of drive pins or threaded fasteners in such materials as concrete, concrete block, cinder block, brick, and steel, is announced by the Ramset Fastening System. With this device, the manufacturer states, a workman is able to drive a 3/16 or 1/4-inch fastener through 1/4-inch steel.

The Shure-Set fastener works on the principle by which a needle can be driven through a coin if it is first driven through and supported by a cork. The tool is recommended for light fastening work which cannot be done by simple methods but does not require the force of a power tool.



Shure-Set ends the need for toggle bolts, expansion shield, anchors, etc., according to the manufacturer.

For further information write to the Ramset Fastening System, Division of Olin Mathieson Chemical Corp., 12117 Berea Road, Cleveland 11, Ohio, or use the Request Card at page 18. Circle No. 160.

#### Spreader attachment

■ The Jersey spreader, manufactured by Tractor Spreader Co., is highlighted in a folder from the firm. The unit is able to spread broken stone, crushed gravel, bank-run gravel, slag, and other base-course materials at a rate of 20 tons per minute. Side, end, and front views of the spreader point out the 6 1/2-ton-capacity hopper, rear strike-off, castored front wheels, widening gates, and transverse crown differential control. Brief specifications are included.

To obtain Form 561 write to Tractor Spreader Co., 630 Terrance Ave., Hasbrouck Heights, N. J., or use the Request Card at page 18. Circle No. 136.

#### Engineering data

■ Engineering and scientific tables and data are incorporated in a booklet from the United States Testing Co. Topics covered are wire and sheet metal gages; weights of various materials; steel-pipe dimensions, capacities, and weights; and moisture-resistance tests. Chemical and physical data, as well as tables on various materials and their properties, are also included.

To obtain this booklet write to the United States Testing Co., Inc., 1415 Park Ave., Hoboken, N. J., or use the Request Card at page 18. Circle No. 137.

—For more facts, circle No. 236

## HAS THE VERSATILITY NEEDED FOR ALL KINDS OF JOBS

### RE, SMOOTH POWER & TRACTION

300 h.p. engine . . . Torqmatic Drive  
27.00 x 33 tires with 33.5 x 33  
flotation . . . 18 yds. struck capacity  
21 yds. heaped at 3:1 slope and  
yds. at 1:1 . . . NoSpin differential  
full hydraulic steering . . . non-  
stop 180° turns in only 36 feet . . .  
hydraulically controlled lever action  
bowl, apron and ejector . . . four  
action reversible cutting blade . . .  
built to work with the biggest push-  
tractors on the toughest jobs.



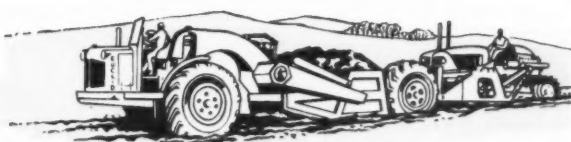
Grading this plant site on the Tennessee River proved the outstanding performance of the 5-18 in difficult material. Heaped loads of heavy clay were picked up, hauled and spread in a hurry. The 300 h.p. engine, big tires, Torqmatic Drive and NoSpin differential pay off in better traction, flotation and work-ability.



Coming and going the 5-18 cuts cycle time. The Torqmatic Drive and 300 h.p. engine permit shifting under full engine power—provide power and speed to move big loads fast. On this North Carolina highway job top extensions were used to increase bowl capacity—loads of 25 yds. and more were moved from borrow pit to fill at high speed.



**COMPARE** the cost-cutting features of "Euc" Scrapers with your present equipment. Your Euclid dealer will be glad to supply information on the complete line—from 7 to 18 yd. struck capacities.



# Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

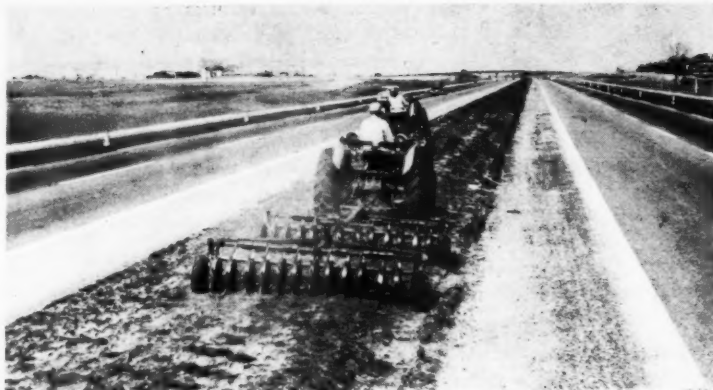




Barreling down the 118-mile strip at speeds up to 6 mph, one pair of Renovatores dig their tines into turf at one side of the median, while the other pair covers the opposite side.

C&E Staff Photos

## Soil aerating machines maintain turf of N. J. Turnpike median strip



Mechanical aeration, done by rigs working in tandem, is followed by spreading of fertilizer on 118-mile pike

# TDA® BRAKES

*if it moves...we can stop it*



### New lightweight . . .

Fabricated steel brake shoes weigh many pounds less than cast shoes. Binding or freezing up is eliminated because double web construction permits limited area fit with one piece cam rollers. Wear areas of the webs are heat treated for long life.

### Unit-mounted . . .

All brake parts are mounted on the spider for compactness. Efficiency is higher and correct cam shaft alignment is assured with close coupled cam shaft and chamber bracket.\*

## "P" SERIES POWER BRAKES designed for heavy-duty service

Here is a brake that gives longer, trouble-free service for trucks, trailers, and all types of industrial and road equipment. These heavy-duty "P" Series Brakes are easy to maintain in service. Simplicity of design is the keynote—with brake, air chamber, and cam shaft all mounted as a unit.

The outstanding features of the Timken-Detroit® "P" Series Brakes give increased economy and performance. Operating temperatures are lower and lining life longer because open-type spiders assure good internal ventilation and rapid cooling. Timken® "Econo-liners" are tapered to provide greatest thickness where greatest wear occurs.

A constant-lift "S" type cam assures uniform application of brake shoes for maximum control and immediate response. Brake adjustments are quick with easily accessible slack-adjusters. Once the adjustment

is made, a lock automatically engages the adjusting screw to prevent its moving during service. Long wearing nylon bushings assure smooth operation with minimum maintenance.

"P" Series Power Brakes are available in a complete range of capacities and sizes to fit every operating requirement.

For additional information . . . with expert consultation, contact Timken-Detroit Brake Division. Complete specifications and information on the "P" Series Brake are available. And a staff of experienced engineers is ready to assist you with any problem you may encounter.

\*"P" Series Brakes are also available with inboard chamber mounting for special applications.

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For every industrial, agricultural or automotive application where braking is required!

TDA plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York  
Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania



For more facts, use Reader-Reply Card opposite page 18 and circle No. 239

A method by which turf on football fields and golf courses is kept in shape was tried out on the New Jersey Turnpike a month ago. A contractor used four 8-foot-wide tractor-drawn soil aerating machines and two spreaders to aerate and fertilize the 118-mile long median on the pike. The width of the strip varies from 10 to 16 feet.

As far as is known, this was the first program of its kind. Despite some unforeseen problems, it has proved so successful that it may well become a standard maintenance procedure.

In work on football fields and golf courses, a Renovatore—a soil-aerating machine made by Rolcor Industries, Minneapolis, Minn.—digs its tines into the turf so that holes are left and a maximum amount of oxygen can get into the soil, while a maximum amount of carbon dioxide can be released. Usually, the rig is pulled across a section twice. Then, after fertilizer has been spread, a stiff-pronged rake or spike-toothed harrow is dragged across the section to provide a good bite for seed; grass is sown, and the entire section is watered so that fertilizer is dissolved and worked down to root level.

### Turnpike job is simplified

This procedure was simplified for the turnpike job, which Bob Arnold, Metuchen, N. J., had to complete in a week's time under a \$30,000 contract from the New Jersey Turnpike Authority. His work consisted merely of aerating the strip with the Renovatores before fertilizer was spread. No seed was sown, so there was no need for rakes to go over the ground after fertilizer had been applied. And the watering job was left to nature.

A total of five rigs was used for this operation—two Ford tractors, each pulling two Renovatores hooked in tandem; a Ford and an Allis-Chalmers tractor, each pulling a New Idea spreader, and a Martin low-bed trailer that kept the spreaders supplied with fertilizer. The entire spread moved fast—hitting as much as 6 mph—and stopped only every half-mile so that the spreaders could be refilled.

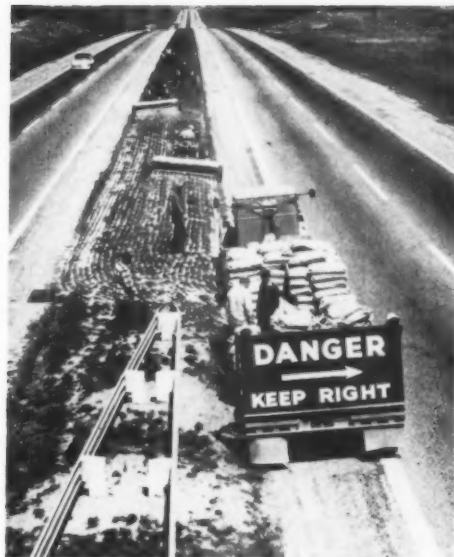
As far as Arnold knows, this is the first time that the Renovatores were hooked in tandem for a job. The second Renovatore in the tandem arrangement was held 3½ inches off

CONTRACTORS AND ENGINEERS



The 8-foot-wide Renovatores, which usually work over an area twice, are hooked in tandem behind Ford tractors, the second soil-aerating machine held just off-center from the first by a contractor-made hitch.

The five-rig spread keeps tightly together. Behind the Renovatores, two New Idea spreaders cover the width of the strip with fertilizer, which is supplied from the Martin low-bed trailer.



center from the first by a secondary pipe hitch, made in the Arnold shop, that consisted of a 3-inch pipe about four feet long. This made it possible for Arnold to get maximum coverage on the strip without going over it twice with one machine.

Two 8-foot-wide Renovatores, pulled in tandem, covered about half the median strip. The second tandem arrangement worked over the opposite half of the strip, slightly overlapping the area covered by the first rig.

Each of the New Idea spreaders, supplied by Ellis Tiger Co., Gladstone, N. J., also covered about 8 feet of the median. The 125 tons of fertilizer, supplied specially for this job by Doggett-Pfeil Co., Springfield, N. J., was high in nitrogen content, containing 37 to 39 per cent by weight, instead of the 5 to 10 per cent usually found in fertilizer.

#### Overcomes job difficulties

Like any method being adapted to a new use, this aerating and fertilizing technique presented problems that Arnold had not bargained for.

According to Arnold aerating and fertilizing a football field or golf course can be done slowly, with low-priced labor, and time is not of prime importance. Just the opposite is true if work is being done on a highway. Then too, golf courses and football fields are usually smooth, while median strips are not.

When Arnold found the aerating rig a little too light for fast and rough work like this, the first thing he did was to replace the axle bolts with stronger ones. He also planned to replace set screws and haunch bolts in the machines with stronger connections, once the turnpike job was done. According to Arnold, increased efficiency might result in work of this type if the hand pump that lifts the rig were powered from the engine.

Spring rains hampered the aerating and fertilizing work from the time the job started at the southern terminus of the turnpike, causing the contractor to lose all or portions of his planned 8 to 10-hour work days. Even with these setbacks, the crew kept moving swiftly northward toward the George Washington Bridge terminus of the pike, completing the job between April 23 and May 1. THE END

**SPECIALISTS**  
IN THE USE  
OF COBI PILES

## PILE DRIVING

For  
High School Foundation  
in  
*Des MOINES, Iowa*  
By  
**C. L. GUILD  
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DES MOINES, IOWA  
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**I**n a trip across the country in 1955 you'd find C. L. GUILD Construction Co., Inc. driving piles from Maine to Florida to Texas — and North.

These projects specified all types of piling — but most were COBI CAST-IN-PLACE Piles, because Guild is a specialist in driving cast-in-place piles and uses COBI PILES exclusively. There are seven reasons why Cobi

Cast-in-Place Piles are best. Write us for these reasons, — and specify COBI CAST-IN-PLACE Piles.

#### TO CONTRACTORS

If you are bidding a job that calls for piles, ask C. L. Guild for an estimate on any type of pile—anywhere. C. L. Guild Construction Co., Inc. is a national organization—specialists in driving all types of piling.

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**EASTERN CONCRETE PILE CO.**

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DIVISIONS

**AMERICAN DRILLING COMPANY**

92 Water St., E. Providence, R. I.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 240

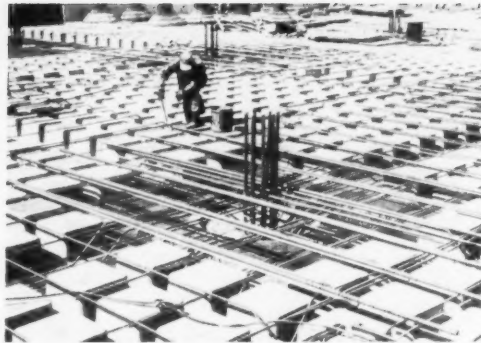


## Glass-fiber domes produce attractive concrete deck

■ Lightweight glass-fiber molds for use as domes in the two-way system of concrete floor construction are available from the American Fiberglass Corp. The forms are stripped by means of compressed air, and reportedly can be used over and over.

In the shape of rectangular domes, the glass-fiber forms produce a smooth finish and reduce voids to a minimum, the manufacturer states. They are non-corrosive and non-conductive. The forms are available in 8, 10, 12, and 14-inch depths and weight between 7 and 7½ pounds, depending on the size.

Made of reinforced glass fiber com-



Fiberglass dome forms produce a smooth finish with a minimum of voids.

pressed under heat, the molds are acid-resistant and extremely strong. They result in a flat deck with an attractive honeycomb-type ceiling for the story below.

For further information write to the American Fiberglass Corp., 1010 Euclid Ave., Cleveland 15, Ohio, or use the Request Card at page 18. Circle No. 78.

## New heavy-duty wire rope takes shock, other abuse

■ An extra-high-strength grade of flattened-strand wire rope has been announced by the Leschen Wire Rope Division of H. K. Porter Co., Inc. Called Porter Imperial Red-Strand wire rope, the new grade is 15 per cent stronger than those previously offered.

Reportedly 25 per cent stronger than top-flight round-strand rope, Imperial Red-Strand can handle greater than normal temporary loads, thus eliminating the necessity of installing a larger rope with the accompanying trouble and expense of new sheaves and other possible equipment changes. Fabricated with a steel core, the new wire rope is said to withstand unexpectedly encountered shock loads without breaking, and to show high resistance to fatigue, abrasion, and crushing.

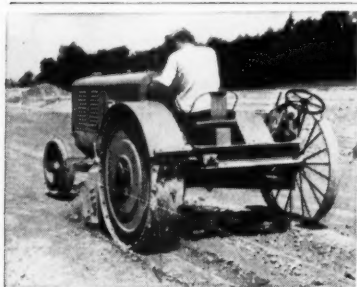
The new product is especially recommended for use on dragline excavators, scrapers, and other big earthmovers whose operation produces shock loads and otherwise submits wire rope to abuse.

For further information write to the Leschen Wire Rope Division, H. K. Porter Co., Inc., 2727 Hamilton St., St. Louis 12, Mo., or use the Request Card at page 18. Circle No. 5.

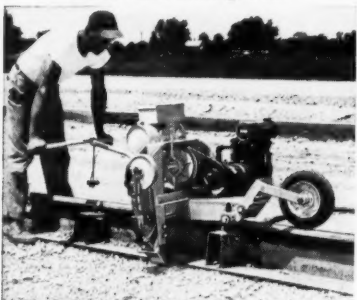
## New sales, service branch opened by Black & Decker

Black & Decker's 40th factory sales and service branch in the United States has been opened at 4617 Jones-town Road, Route 22E, Harrisburg, Pa. The branch will provide complete repair and service facilities.

The service manager for the branch is Joseph E. Watson. Both this branch and the Philadelphia branch are under the management of Eric H. Federsmidt.



Cleveland Formgrader



Cleveland Form Tamper

## This RUGGED PAIR CUTS ROADBUILDING COSTS!

NOW EQUIPPED with hydraulic controls and power steering, the new, improved Cleveland Formgrader will simplify your form setting and do a better job of it at less cost. One man in 6 hours can cut 6,480 feet of form trench, leaving it compacted and rolled—ready for instant setting of forms.

The Cleveland Form Tamper quickly and easily tamps and oils forms, producing a more uniform job at far lower cost than hand labor. When left hand and right hand models are used in tandem the tamping rate is . . .

**50' per minute!**

Let this powerful team speed up construction and cut costs for you—as it has for contractors all over the nation! See your Cleveland Formgrader distributor or send coupon today for full information.

**CLEVELAND FORMGRADER CO.**

Mills Road • Avon, Ohio

- ☐ SEND NAME OF NEAREST DISTRIBUTOR.  
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For more facts, use coupon, or circle No. 241

52

## Less down time...longer life when protective maintenance is done ON TIME!



## HOBBS Engine Hour Meters

Modern engineers consider maintenance of powered equipment in terms of HOURS instead of miles. ON-TIME lubrication, filter replacement, oil change, overhaul, etc., means better performance and longer equipment life.

The Hobbs Meter, a true electric timing instrument, records actual running time in HOURS and MINUTES—not a revolution counter! Two models—direct-reading (upper illustration) and pointer type. Approved and recommended by leading manufacturers of construction equipment. Ruggedly built . . . easy to install in the field. See your factory branch, representative or distributor . . . or WRITE:

**John W. Hobbs Corporation**  
2067 YALE BLVD. SPRINGFIELD, ILLINOIS  
A Division of Stewart-Warner Corporation

For more facts, use Reader-Reply Card opposite page 18 and circle No. 242

## THIS ADVANCED DESIGN POWER BUGGY operates like an automobile



### TELESCOPING VIBRATORY SCREED

No beam overhang. Quickly adjustable length (to nearest fraction of inch), fits any form width. Shoe-plate NEVER rides the forms.

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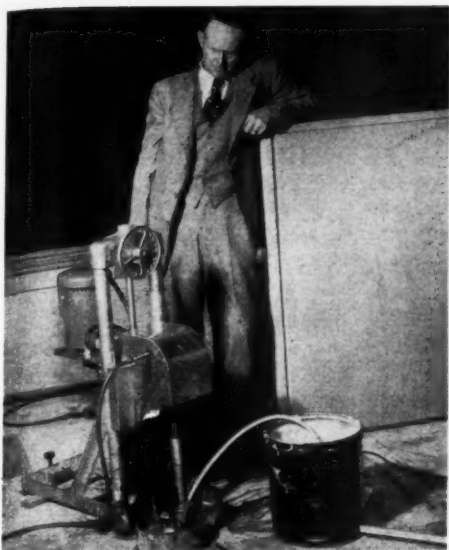
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 243

CONTRACTORS AND ENGINEERS



### Core cutter operates at 1 inch per minute

■ An electric or gasoline-powered core-cutter that will drill round holes from 1 to 6 inches in diameter through most materials is available from the J. F. Hamlin Co. The saw's standard depth of cut is 8 inches, but extension shafts are available for deeper cuts.

The Kor-It saw uses diamond-faced core drills and has a feed method that keeps constant pressure on the bit. The manufacturer rates it at a cutting speed of one inch per minute. Mounted on small wheels, it weighs 150 pounds.

The electric model operates on 110 or 220 volts. A tap to supply water through a hose is the only facility required for operation of the unit. With cradle attachments, it will drill at any angle between vertical and horizontal.

For further information, write to the J. F. Hamlin Co., 746 Ellis St., San Francisco 9, Calif., or use the Request Card at page 18. Circle No. 143.

### Safety device prevents boom from falling

■ A device which is said to eliminate the possibility of the boom of a power crane dropping if the operator loses control is available from Lee A. Cuson.

The unit, called an automatic safety boom control, regulates the unwinding of the boom cable by coupling the drum movement to the engine of the crane. If the crane operator loses control of his boom, the safety device automatically intercedes and applies the crane engine as a control on the boom.

For further information write to Lee A. Cuson, McKerchey Bldg., 2631 Woodward Ave., Detroit 1, Mich., or use the Request Card at page 18. Circle No. 108.

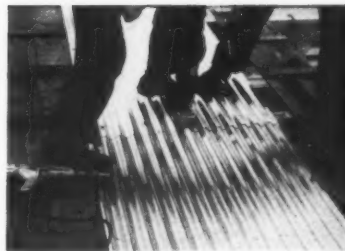
### Sales representative named for H. K. Porter divisions

Joseph A. Bell is the new district sales representative for the Leschen Wire Rope, Quaker Rubber, and Henry Disston divisions of H. K. Porter Co., Inc., New York, N. Y. Bell's territory includes North Dakota, Wisconsin, Michigan, and northern Minnesota.

### New system for fastening sheet aluminum to steel

■ Corrugated aluminum roofing and siding can now be fastened to steel building frames with powder-actuated tools by means of a system that uses a newly-designed steel drive pin and aluminum cap nut. The new system overcomes the corrosive action of steel to aluminum, according to the Powder Power Tool Corp.

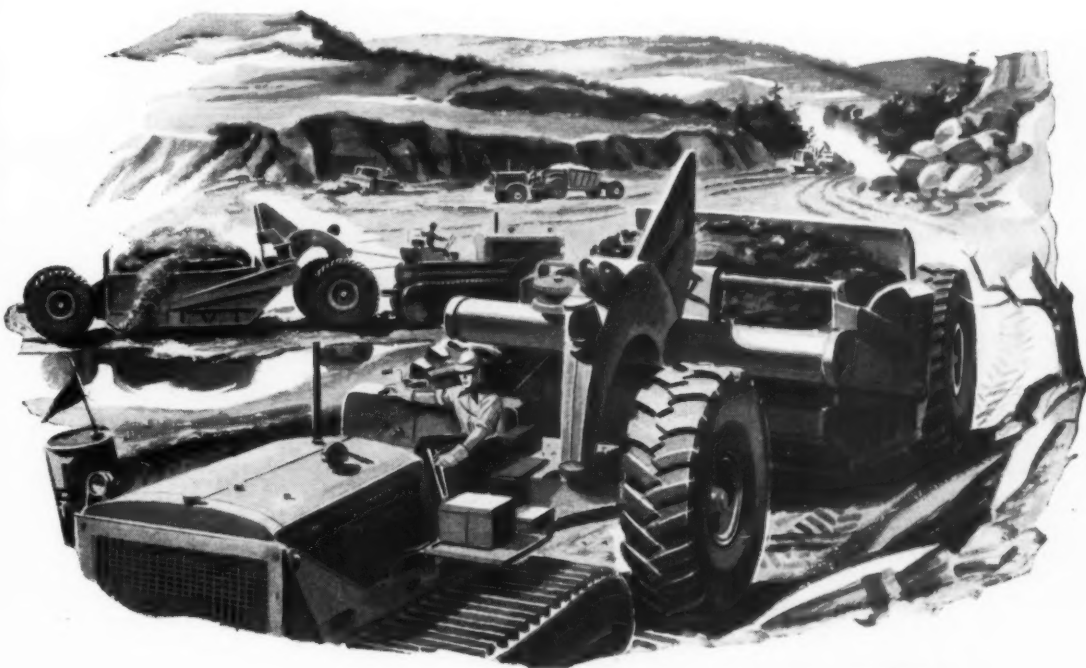
The fastening process consists of driving the pin through corrugated aluminum, laid in position, and into the steel frame of the building with a Drive-It powder-actuated tool. The aluminum cap nut with washer is then screwed down tight over the drive pin, forming a tight fastening and a seal against the weather.



Using new steel drive pins and aluminum cap nuts, which are said to overcome the corrosive action of steel to aluminum, workmen fasten corrugated aluminum roofing to a steel structural frame.

For further information write to the Powder Power Tool Corp., 5001 S. E. Johnson Creek Blvd., Portland 6, Oreg., or use the Request Card at page 18. Circle No. 98.

## NOW...THE ALL-NEW, ALL-DUTY GENERAL L.C.M. with stronger-than-steel NYGEN® CORD!



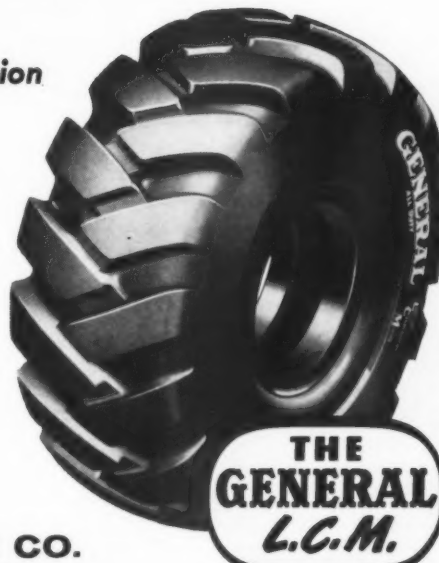
### Featuring crawler-like traction and flotation

● GREATEST ever developed by tire engineers, this rugged new General L. C. M. more nearly approaches ideal crawler-like flotation and traction than any other tire.

● BUILT with opened-up tread design, the L. C. M. is truly an all-duty tire for all type operations. Reduced rolling resistance increases tread life.

● EXCLUSIVE stronger-than-steel Nygen Cord provides the new General L. C. M. with maximum protection against breaks, growth and damp rot.

● WIDER, heavier tread with deep-drive cleats protects sidewalls against costly cuts and snags... puts more rubber on the ground for less stress per-square-inch.



**THE GENERAL TIRE & RUBBER CO.**  
AKRON, OHIO

Specify GENERAL Tires on your new equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 246



# A blueprint for public relations

**Building Construction Employer's Association  
of Chicago turns the spotlight on "worry-free"  
work done by members**

Handsome dividends for member contractors—though not actually in the form of cash—are the result of the effective public relations job being done by the Building Construction Employer's Association of Chicago, Inc., the central organization of the building trades association in Chicago. Its program has worked so well—for its members and for the entire construction industry in the area—that it might well be taken as a blueprint for a public relations program by any contractor organization on any level—national, regional, state or local.

The program had its inception several years ago, when BCEA became concerned over the fact that in times of building booms, the public tends to be increasingly aware of money spent for construction, but not quite as aware of the contribution the industry makes to higher standards of living, economic security, and civic progress. The job BCEA laid out for itself involved reversing this trend and making the public aware of the work of member contractors.

The program has six major points, all of them aimed at accomplishing one specific purpose: getting the fact across to prospective builders, architects, engineers, and the general public that member firms are responsible, reliable, and capable of handling any kind of construction. Such a publicity program will not solve all members' problems, but it goes a long way toward creating and maintaining good will for BCEA contractors.

First of all, the program is designed to bridge the gap between contractor and public, so that misunderstandings can be avoided. Getting factual information to the public also helps counter the feeling of the man in the street that cheapness and economy are synonymous. One of the important phases of the program is concerned with calling public attention to the qualifications of its members. Another is improving press relations for builders. Still another is using the association to build an understanding atmosphere in which industry can operate to full efficiency.

## Program started

When BCEA decided to do press-agency for contractors several years ago, the logical jumping off place seemed to be a survey that would reveal just what kind of information was needed by the public. And so questionnaires went out to building investors, architects, engineers, government officials, executives, and editors.

All the questionnaires were tailored so that they would yield the maximum amount of information from the type of person being questioned. Editors, for instance, were asked such questions as "What material do you like to receive about the building industry?", and "What do you think the general public would like to know about any association in the building-industry field?" Presidents of large companies were sent industrial-construction trends questionnaires, which asked among other things, "What do you look for when you hire a contractor?",

and "How could firms improve services to you?"

The studies showed that the first major step in an energetic public relations program would have to be the development of a suitable brochure that could be distributed without cost to builders, engineers or anyone interested in any phase of construction. Then BCEA checked to see how other organizations had handled the job of publishing a brochure, with the idea that its booklet should be as good, or even better, than any that had been published so far. Opinions were sought



## AMERICAN SETS 8-TON PIPE SECTIONS WITH PIN-POINT ACCURACY

On a storm drain extension project in the City of Memphis, an American 300 Series Truck Crane turned in a versatile, efficient performance under difficult conditions. Operated as both a clamshell and a crane the American dug the trenches and helped set huge 108-inch diameter concrete pipe sections weighing 16,650 pounds. High tension wires, railroad tracks, and close quarters in the city were problems easily overcome by the American

Truck Crane's mobility and by its sure-footed stability. W. R. Riley, Construction Superintendent for M & W Construction Co., Tupelo, Miss., says: "American's power control boom lowering helped place those big pipe sections fast and with pin-point precision. With American handling the load, the boys down in the pits knew the job would be handled safely, too. We consider the American our work-horse—a real producer."

CONTRACTORS AND ENGINEERS

from building investors, architects, and engineers so that the proposed brochure would be as helpful as possible.

The result was "True Efficiency in Building", a booklet that has been consistently in demand since it was first published several years ago. Distributed without charge to architects, engineers, and key people in government, utilities, and schools, it contains a check list that answers 20 questions concerning the development of a building program investment. Answers to such questions as "When is

the time to build?", "What about per square-foot construction costs?", "Is it possible to keep construction costs within the planned budget?", are couched in laymen's language. This check list covering every important phase of a construction program is supplied in sheet copies so that BCEA members can use them on individual jobs. The brochure also contains a typical BCEA contractor's work-progress schedule, and explains why work done by BCEA contractors is "worry-free construction." A check list of items to be considered for optimum-

cost building projects is included.

Since the start of its program, BCEA has taken advantage of every possible means and every available medium to tell its story and its aims. The entire program is geared to the demand of editors and the public. The public wants to be told about construction, BCEA found, particularly about new materials and methods, unusual construction jobs, industry trends, and those facts that will be of help to persons planning to build.

Keeping the public advised of its activities, BCEA finds, is a continuing

job. The survey approach is re-used constantly. Polls are taken about twice a year so that the organization can keep tabs on the information needed by the public. Things like its apprenticeship-recognition program are put before the public. When BCEA participated in a recent trade show, it built a display showing its activities and purposes—and built it so that the display could be used for future conventions and trade shows. When BCEA gave a thousand dollars for the construction program fund of the Illinois Institute of Technology, and when it donated a like amount to the Western Society of Engineers, the public was kept informed.

Right now, people in the Chicago area are aware that the joint conference board established by BCEA in cooperation with the Chicago and Cook County Building and Construction Trades Council has virtually eliminated work stoppages due to jurisdictional disputes. Though they may be aware that a number of such disputes have been settled without strikes, they may not know that the total comes to 260. And they know, too, that BCEA has won an award from the American Trade Association in Washington, D. C., for its work in preventing job tie-ups. They know that BCEA contractors are responsible for about 85 per cent of the commercial and industrial construction work in the Chicago area, and that the contractors, working under the BCEA code of ethics, assure builders and public alike "worry-free construction."

THE END

### Toll road bridges open; link N. J. and Pa. pikes

The last two links in two super-highway systems opened a little more than a month ago on two successive days. The first to go into operation was the Delaware River Turnpike Bridge, connecting the New Jersey and Pennsylvania Turnpikes, and making it possible for motorists to travel toll roads directly from New York City to the Ohio-Indiana line. The next day, the last link in the 164-mile Garden State Parkway—the Great Egg Harbor Bay Bridge between Atlantic and Cape May counties in southern New Jersey—opened to bring the minimum parkway project to completion in little less than four years after the start of construction.

An estimated 10,000 vehicles will use the 6,571-foot-long Delaware River Turnpike bridge during the first full year of operation. Costing \$27,200,000, and carrying six lanes of traffic from Florence, N. J., to Edgely, Pa., the bridge was constructed in two years. A toll of 30 cents is being charged for passenger vehicles.

The 1 1/5-mile Great Egg Harbor Bay Bridge, the longest of 285 spans on the parkway, is actually two bridges connected by a causeway. It has two 13-foot lanes in operation, but has been designed so that two additional lanes can be constructed when traffic warrants. A toll of 25 cents is being charged for the use of this span.

**FAST CLAMSHELL WORK** by the American 300 Series Truck Crane keeps work moving without delay on the City of Memphis storm drain extension project. "The American is really engineered for top capacity," says Mr. Riley, Construction Superintendent. "Everything's handy for easy maintenance." Double hook rollers on American's machinery deck provide a free rolling action for smooth swings. Standard-size anti-friction bearings used in all high speed shafts, gears and assemblies give fast, smooth operation and reduce wear and maintenance problems. Clutches are designed to give perfect feel-of-load at all times and wide, machined clutch making surfaces provide an extra margin of safety under the toughest working conditions.



**CONTROL ALL THE WAY** with power lowering, standard on American 300 Series Crawler Cranes, makes setting of steel a safe as well as efficient operation. American's retractable high mast can be raised and lowered by the bail rigging without special equipment. All assemblies and grease fittings are readily accessible for routine adjustments and lubrication. Features like these have proved money-makers for cost-wise, safety-conscious contractors across the country.



**FOR REAL VERSATILITY** as a lifting crane, or with shovel, backhoe or dragline, you'll find the American 100 Series Truck Crane tops in its class. You can move this machine quickly and easily from job to job—travel over highways at speeds up to 35 mph. Low initial cost—12½-ton and 15-ton capacities.

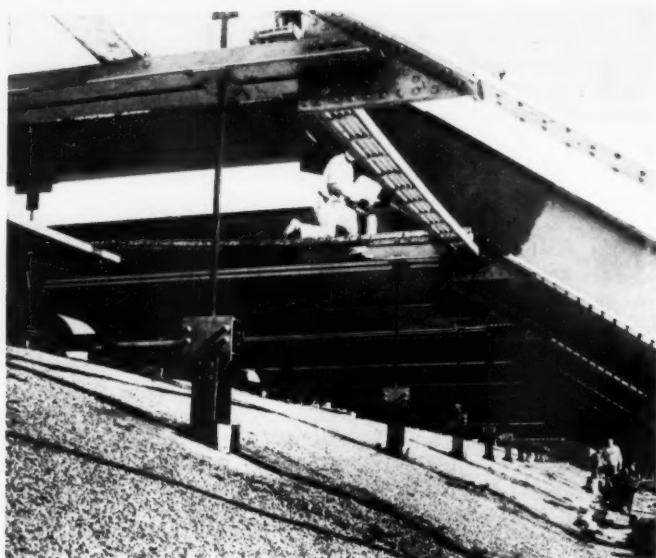
**ROUND THE GLOBE** on the world's biggest and best jobs, American products have been famed for engineering brilliance and production prowess for over three-quarters of a century. From gigantic, specially-designed Derricks, massive Revolver Cranes, efficient Electric Locomotive Cranes, to the construction industry's top-producing Crawler and Truck Cranes—American leads the way. To put American dependability to work for you, contact your local American distributor, or write American Hoist & Derrick Co., Paul 1, Minnesota.

## AMERICAN HOIST and Derrick Company

St. Paul 1, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 247





A NEW APPROACH to overhead space problems added 11 feet of extra headroom for a factory building in Farmingdale, N. Y., converted by the Republic Aviation Corp. for use in the limited assembly-line production of top-secret experimental air craft. By suspending the wood arched roof of the building from an external overhead steel frame, Republic was able to remove the bottom-chord wood arch ties inside. High-strength bolts manufactured by the Russell, Burdall & Ward Bolt & Nut Co. were used by the White Plains Iron Works, Peekskill, N. Y., steel erectors, to effect a saving in alteration costs of \$7 per ton of steel. For further information on these high-strength bolts write to the **Russell, Burdall & Ward Bolt & Nut Co.**, Port Chester, N. Y., or use the Request Card at page 18. Circle No. 102.

## DIGS A NEW LAKE IN 30 DAYS!

**That's the record of this Bucyrus-Erie 1½-yd. dragline for Colorado contractor**

Said Pioneer's operator of this dragline: "I have run many and like the 38-B best."



On a new highway near Monte Vista, Colo., the Pioneer Construction Co., Pueblo, Colo., excavated and loaded 45,000 cu. yd. of alluvial gravel in 30 days with a Bucyrus-Erie 38-B dragline. The excavation site is now a lake well stocked with fish.

The Pioneer Construction Co. was formed in January, 1955. Its growth reflects the wide experience and sound policies of the key men. They believe it takes the best of modern equipment, efficiently operated and properly main-

tained, to stay in business in contracting. Their experience with two Bucyrus-Erie 38-B's, one rigged as a dragline and the other as a shovel, has proved out this policy. These machines offer good production ability, and they are operated and maintained in a manner to provide economical performance.

Let your Bucyrus-Erie distributor give you complete details on these modern excavators — ½ to 4 cu. yd. — and show you how they can help bring top efficiency to your operations.

197E56

**BUCYRUS  
ERIE**

SOUTH MILWAUKEE

WISCONSIN

Pioneer's second Bucyrus-Erie 38-B, a 1½-yd. shovel working in another pit, also loaded out gravel at the rate of more than 1,500 yd. in 8 hours.



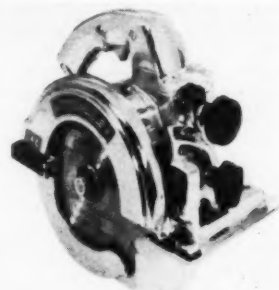
For more facts, use Reader-Reply Card opposite page 18 and circle No. 248

## Powerful electric saw weighs only 11 pounds

■ A heavy-duty 6½-inch portable electric saw for builders, carpenters, and others in the construction field has been introduced by the Porter-Cable Machine Co. The Model 146 weighs 11 pounds and is driven by a 1½-hp motor at 3,670 rpm under load.

A calibrated depth gage, adjustable from 1/32 to 2 3/32 inches, eliminates guesswork on the deepness of the cut. The gage is set by loosening a depth-adjustment knob. Depth graduations are cast in the depth-adjusting slide for permanent legibility.

A telescopic guard provides a safety lip on the leading edge to prevent jamming when the saw enters stock on any cut, even a compound miter cut. The contour design of the saw's



The Porter-Cable Model 146 portable electric saw cuts wood, at any angle from 1/32 to 2 3/32 inches deep. It weighs 11 pounds.

rear face eliminates drag during the entire cutting cycle. A large lever facilitates retraction of the guard when making pocket cuts.

The electric saw features newly-designed coil springs and a kick-proof clutch that automatically puts the blade in neutral if it jams or pinches in the cut.

For further information write to the Porter-Cable Machine Co., 74 Exchange St., Syracuse 8, N. Y., or use the Request Card at page 18. Circle No. 159.

## Announce improvements in form-trench cutter

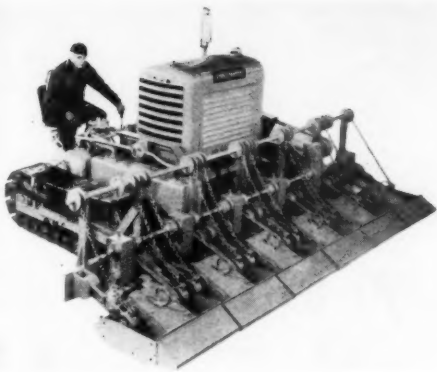
■ New improvements in the Cleveland Formgrader, a machine designed to cut form trenches quickly and accurately for road construction, include power steering, a hydraulically operated cutter lift bar, and an improved self-starter.

The machine now enables one man to cut form trench to exact grade, and in six hours it is possible to cut 6,840 linear feet of form trench, according to the company. The power steering is said to add materially to ease of handling, thereby increasing accuracy.

Of sturdy construction, the Formgrader uses a heavily weighted drive wheel which follows in the path of the cutter blade and simultaneously compacts and rolls the trench so that it is ready for setting of forms. The unit is also available with a crawler track drive.

For further information write to Cleveland Formgrader Co., R. D. 1 Mills Road, Avon, Ohio, or use the Request Card at page 18. Circle No. 19.

CONTRACTORS AND ENGINEERS



The International Vibration Corp.'s Vibro-Tamper has been redesigned with heavier rotors for increased compaction efficiency.

### Heavier rotors increase compactor's efficiency

■ A 17.5 per cent increase in the weight of the eccentric rotors in the redesigned compaction shoes of the self-propelled VT 6-4 Vibro-Tamper increases the machine's efficiency in the single-lift compaction of subbase and base courses in highway and runway construction, according to the manufacturer, the International Vibration Co.

The Vibro-Tamper achieves its compaction by means of six shoes equipped with eccentric rotors in opposition, V-belt-driven from a common floating power shaft connected to a 75-hp industrial engine. With the added rotor weight, each shoe now provides a compaction force of over 8,640 pounds at 2,200 vibrations per minute.

The efficiency gained with the 80-pound rotors is said to enable the machine to compact single lifts of sand, gravel, and other granular materials of up to 12 inches in only two passes at a rate of 20 to 38 fpm, obtaining as high as 95 to 103 standard modified Proctor density. The machine also handles single lifts of stone of up to 14 inches.

For further information write to the International Vibration Corp., 16702 Waterloo Road, Cleveland 10, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 153.

### Wire-rope fittings

■ Wire rope fittings and accessories are covered in a catalog from Farrell-Cheek Steel Co. Some of the parts diagrammed and described are choker hooks, sockets, and sheaves. Specification tables accompanying each model contain such data as rope size; outside, groove, and hub diameters; width over flanges; and bore size.

To obtain Catalog No. 22 write to Farrell-Cheek Steel Co., Sandusky, Ohio, or use the Request Card at page 18. Circle No. 65.

### Thor opens new branch

Thor Power Tool Co., manufacturer of portable air and electric tools with headquarters in Aurora, Ill., has opened a new branch factory sales and service office in Kansas City, Mo. The branch will serve as a sales and service center for distributors and users of Thor products in Kansas and Oklahoma, and parts of Iowa, Missouri, Nebraska, and the Panhandle of Texas.

JULY, 1956



"What make tractor did you say you were selling?"

## Naugatuck Surfa-SEALZ



# Let's build highways to last!

DETOURS can't be avoided while new highways are being built...but there is a way that promises to *keep* those highways in *good condition, longer*, once they are opened! That is by building them with a rubber-bituminous or rubber-asphalt surface course...using Naugatuck's SURFA-SEALZ® as the synthetic rubber additive.

Year by year, test sections of "rubber roads" throughout the country continue to confirm the promise of longer life and greatly reduced maintenance! Accelerated laboratory tests add further evidence of increased adhesion to aggregate and strength of binder under a wide range of temperature and aging conditions.

Experience has shown that admixture of only 8-9% of SURFA-SEALZ makes it possible to use a *softer* asphalt surface, since the rubber retains the natural oils instead of permitting them to bleed to the surface. This greatly postpones the time when embrittlement begins to cause cracking and the need for repairs.

SURFA-SEALZ is readily available in convenient form for admixture at the job...requires no special equipment...involves no complications...adds only slightly to initial paving costs! Isn't it time *you* started making use of its advantages?



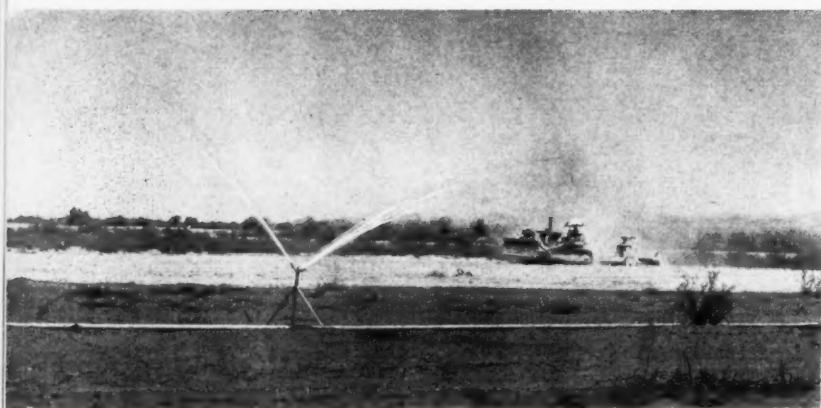
## United States Rubber Naugatuck Chemical Division

Naugatuck, Connecticut

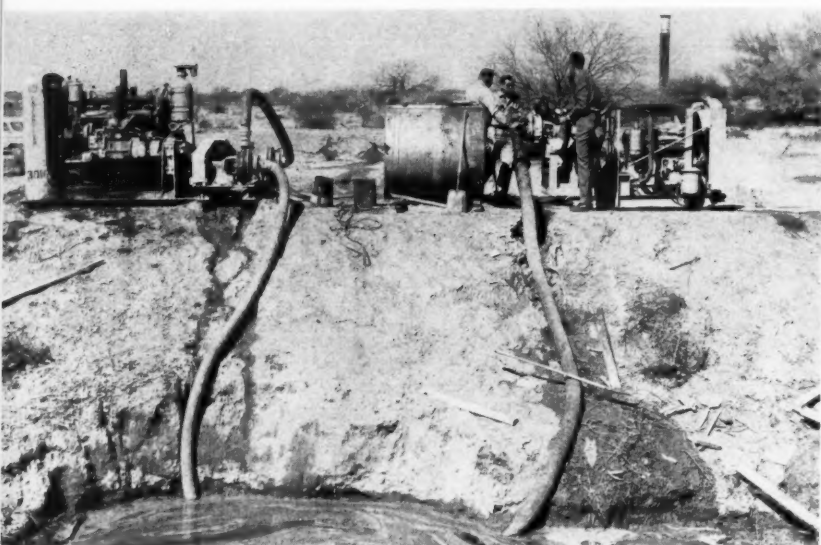
BRANCHES: Akron • Boston • Chicago • Memphis • New York • Philadelphia • Mfg.: Naugatuck • Gastonia • Los Angeles • CANADA: Latex Div., Dominion Rubber Co., Ltd., Montreal • Cable: Rubexport, N. Y. Rubber Chemicals • Synthetic & Reclaimed Rubber • Plastics • Agricultural Chemicals • Latexes

For more facts, use Reader-Reply Card opposite page 18 and circle No. 249





Instead of wetting fill material at the job site, the contractor used a total of 8,000 linear feet of pipe and 14 Rainbird sprinkler units to moisten material in the borrow pit.



Water for the wetting operation comes from the Beardsley irrigation canal. Caterpillar and Cummins diesel engines power Gardner-Denver pumps that shoot about 120 psi of water through the 6-inch delivery lines.



Much of the credit for keeping the job ahead of schedule goes to Cat tractor units that helped the Euclids make good time in picking up capacity loads of the moistened borrow.



Over the top of the dam goes a loaded Euclid, on its way to place material for a lift on the  $2\frac{1}{2}$  to 1 slope on the reservoir side. This operation eliminated the need for access ramps and gave additional compaction to the fill.

## Pre-watering of borrow pit hurries earth-fill dam job

**Scrapers drive over crest of 25-foot-high dike to place earth for densely compacted facility that will protect air base from floods**

by RAY DAY

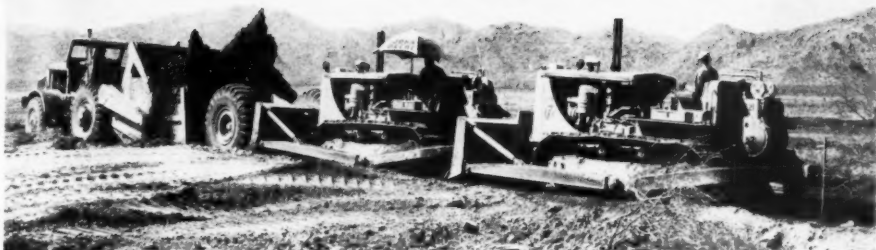
A sprinkling system like that used by farmers to irrigate soil, a heavy compaction unit getting fill densities 1.1 per cent higher than specifications, and fast hauling by ten rigs that moved an average of 20,000 cubic yards of earth in 10 hours put a 9-mile detention dam far ahead of schedule near Beardsley, Ariz.

The job was the recently completed Trilby Wash Detention Reservoir, a U. S. Army Corps of Engineers' project that will give flood protection to Luke Air Force Base. The dam averages 25 feet in height, is 100 feet wide at the base, and has a 12-foot crest width. On the reservoir side, it has a side slope of  $2\frac{1}{2}$  to 1; the slope on the opposite side is 2 to 1. Maximum water surface will be held 7 feet below the 1361 crest elevation, while the outlet discharge is 26 feet below the crest.

Three miles of the main earth fill parallel a lower earth-fill levee built some years ago by the Beardsley Irrigation District. Six miles of embankment extend from this dam to the White Tank Mountain side of the detention basin. The outlet channel runs to the Agua Fria riverbed just below the point of flood danger. A reinforced-concrete siphon to carry the irrigation district's main canal under the outlet structure of the dam, and the reinforced concrete outlet



As soon as  $7\frac{1}{2}$  inches of earth has been dumped for a compacted 6-inch lift, the single Southwest C-50 pneumatic compactor makes two passes to get the fill to the required 95 per cent Standard AASHTO density.



Two Caterpillar D8 tractors team up to push-load a Euclid scraper in the borrow pit. A fleet of ten Euclids hauled an average of about 20,000 yards of material in a 10-hour day.

structure itself, were also included in the \$1,393,273.50 contract. A wide spillway, protected by grouted stone and a derrick stone apron, permit peak flows to pass.

Before coming up with a plan that would best get the job done, Frederickson & Kasler, Sacramento, Calif., low bidder on the job, made a detailed study of the specifications and held a number of conferences with Corps officials.

Soil-boring analyses by the Corps of Engineers showed that the principal soils to be handled were a yellowish-red sandy clay and a lighter-colored caliche. A few pockets of gravelly sand, suitable as fill, and several deposits of semi-solid caliche were also included.

The Corps uses the Standard AASHTO compaction testing method, and from a design standpoint it was desirable to obtain densities of at least 95 per cent of this maximum. Moisture content had to remain at least at 90 per cent of optimum in this material, since the earth fill will impound water for short periods of time. Specifications outlining compaction procedures called for eight passes by sheep'sfoot, or four passes by a 50-ton pneumatic roller on a 12-inch lift of soil with optimum moisture content.

The first problem tackled by Frederickson & Kasler was the means of getting optimum moisture into soil in the borrow pit, and the revolving sprinkler irrigation systems used by nearby farmers for years seemed to provide the best method of doing this.

This procedure did away with the need for watering equipment to operate on the fill, leaving the area less congested than would ordinarily be the case.

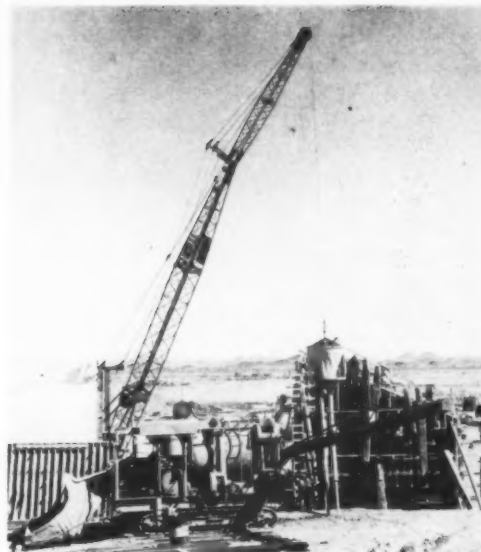
Congestion was reduced even further when the contractor selected one Southwest C-50 pneumatic unit for compaction, rather than a number of sheep'sfoot units. Some of the equipment was made to do double duty: a dozer was needed on the fill in case loads were concentrated in one area, so the contractor brought in a twin set of Southwest sheep'sfoot rollers to be used behind the tractor-dozers during times when this rig would usually be idle. A second twin set of Southwest sheep'sfoot units was on hand as a spare.

#### Watering borrow pit

Water for testing the borrow pit was supplied through some 8,000 lin-

(Continued on next page)

Placing about 2,000 cubic yards of concrete for structures, and 8,200 yards of riprap was also included in the contract. Here, concrete is mixed at the site of the outlet structure by a Koehring 34-E paver and delivered to forms by a P&H truck-crane with a Gar-Bro 1-yard bucket.



## Semi-Automatic Rebuilding of SHEEPSFOOT TAMPERS

A novel idea for salvaging sheep'sfoot tampers, with a saving of 45% in cost and 50% in down time, originated with Dave Moodie, master mechanic of J. A. Thompson and Son, large West Coast contracting firm.

As routine maintenance procedure the 220 individual tamper boots on each of the 24 compactors operated by this firm were manually hard-faced until recently in a circle-and-cross pattern; the tamps lasted three or four months before a loss of gauge made them no longer usable. In an eight hour shift the maintenance welder could manually rebuild and hard-face 18 worn tamps.

Since the firm installed a semi-automatic welder adapted to the use of Stoddy  $\frac{7}{64}$ " wires, the picture has altered completely. Today the welder, using Stoddy 121, rebuilds 70 worn tamps in a single shift! Mr. Moodie's procedure employs "weld-casting" of the wearing face, using a split carbon mold of the correct finish dimensions. Stoddy 121 is applied by the semi-automatic welder, with the mold shaping the large puddle to produce a hard-faced wearing surface of the required depth and gauge.

The rebuilt tampers hold their size twice as long at a considerably lower cost than hard-faced standard replacement boots. Material and labor are approximately \$1.25 each for the rebuilt tamper.

You will find many suggestions for prolonging the life of all types of heavy equipment in the Stoddy Guidebook. Your Stoddy dealer has a copy for you. Look him up in the "Yellow Pages" of your phone book or write direct.



More speed, easier build-up and automatic sizing are obtained by this carbon mold clamped around the sheep'sfoot tamper. Stoddy 121 wire is applied semi-automatically.



Mold is machined to correct size, grips stem tightly to hold weld metal on wearing surface.



Notice how gauge is still held after 4 months service. Impact strength of Stoddy 121 withstands repeated blows of twelve pound sledge used to seat and align tamps during installation.

#### STODDY COMPANY

11936 East Slauson Avenue  
Whittier, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 250



(Continued from preceding page)

ear feet of 6-inch-diameter, quick-coupling aluminum pipe that was laid from the Beardsley Irrigation District canal to the borrow area. Down the center of this delivery line, a 14-unit bank of Rainbird  $\frac{3}{8}$ -inch-orifice sprinkler heads was set. Each sprinkler covered a 160-foot-diameter area.

The first pumping units used with this setup were a twin set of centrifugal pumps and one larger pump, all of them driven by gasoline engines. But because the gasoline engines did not stand up well under 24-hour operation and because pump capacity was not enough to wet an amount of material that would keep the hauling fleet busy, the pumps were set aside for secondary use and a completely

new setup substituted for them.

Two units were used, one driven by a Caterpillar diesel engine, the other, by a Cummins diesel engine.

The new pumps were Gardner-Denver's high-speed, high-pressure centrifugals; two were used in each unit—one for suction and one for discharge. These pumps shot water over the borrow area at an average pressure of 120 psi.

The work cycle started with caliche soil and clay being pre-ripped by a Caterpillar D6 tractor using a 10-foot hydraulically controlled tool bar with 24 scarifier tooth shanks that was manufactured to company specifications by Arizona Machinery Co. of Tucson, Inc., in Phoenix. This pre-ripping made it possible for water to go from 6½ to 7 feet into the caliche

and clay in a 48-hour period of sprinkling. The same amount of sprinkling made it possible for water to reach a depth of 10 feet in gravelly sand. A 72-hour period of sprinkling, along with additional ripping by a LeTourneau K-30 roter, was needed to get optimum moisture into harder caliche.

The borrow pit material was not touched for about a week after being sprinkled, the soil being saturated beyond optimum moisture content required for compaction and it being necessary for excess moisture to drain into the subsoil. If the 8-inch dry layer forming on the surface during this leaching period did not mix in with the wet material, the surface was again sprinkled before excavation started by one of three 3,000-gallon truck-mounted tanks on the job.

The hauling work was done by a fleet of ten Euclid 6-wheel motor scrapers, each of which was pushed by two Caterpillar D8's in tandem. Both the use of twin pusher units and prewatering enabled the haul units to load and operate at a good rate of production.

When earth-fill work started, the contractor believed that access ramps would have to be built every 500 feet in 1,000 to 4,000-foot-long fill sections. But the four veteran skidders operating the Euclids that were first on the job began to dive their units over the 2½ to 1 side slope on their way back to the borrow pit. This practice continued until the dam topped out at its 25-foot height. As a result, additional compaction was applied to the reservoir structure, which was later dressed by bulldozers.

The fast-moving dirt fleet, working one 10-hour shift per day, handled an average of 20,000 cubic yards of material, and sometimes as much as 30,000 yards. Sections worked ranged from 1,000 to 4,000 feet in length, material being spread in the longer sections when the haul was short, so that units could spread out on the fill. When hauls were long—and some were as much as 5,000 feet—the fill area worked was smaller.

The contractor, after securing permission to split the 12-inch lifts, placed the material in two 6-inch lifts. As Euclids spread 7½ inches of material on the fill, the Southwest 50-ton pneumatic Compactor, towed by a Cat DW21, made two passes over the lift. The full-oscillating feature of the four weight boxes on this machine made the tires reach down to all uncompacted spots. This machine made two more passes after the second lift was spread, then density checkers ran their tests. Additional rolling was rarely necessary.

The fill job was handled without motor graders to knock down material as it was placed. The spot-leveling required was handled entirely by the dozer-equipped Caterpillar tractor that pulled two sheepfoot rollers in its spare time.

During the topping-out stage, the equipment fleet sometimes split up so that the fill area did not get congested. The mobility of every unit made it easy for the contractor to switch any piece of equipment to another part of the fill.

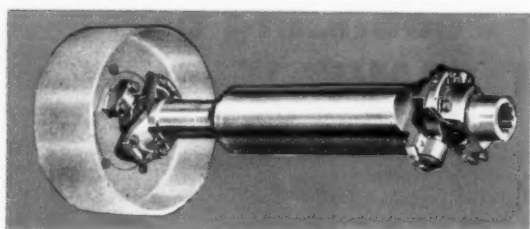
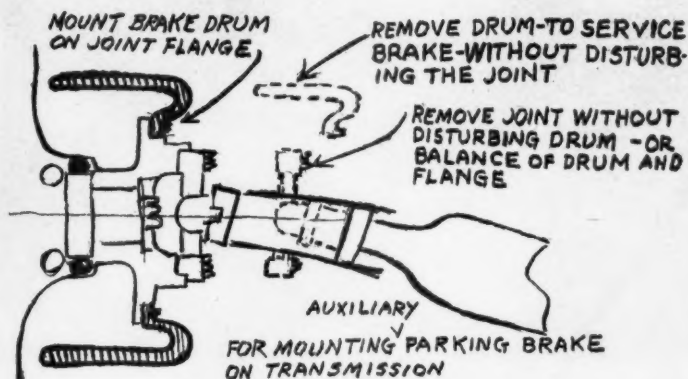
#### Concrete and riprap

The remaining work on the structure included placing about 2,000 cubic yards of concrete for the siphon and the dam's outlet works; 4,600 cubic yards of grouted riprap cobbles weighing up to 200 pounds each along the spillway; and 3,600 cubic yards of dumped riprap weighing up to 2,000 pounds each at other points along the spillway.

The reinforced-concrete structures were constructed in plywood forms that were made on the job with power-saw equipment. Forms were held in place by 2×4 studs, doubled 2×4 wales, and Burke form hardware. Aggregates and sand, produced commercially, were trucked to the job and mixed at the placement site by a

## Prevent Run-Away Trucks—THIS EASY WAY

Truck manufacturers found that serious accidents, caused by run-away trucks, can be prevented by improving the auxiliary parking brake on the transmission. The problem was to mount the brake drum on the universal joint flange. MECHANICS engineers studied and solved the problem—as shown in the sketch at the right.



Note that the brake drum is mounted directly on the flange of the universal joint. Also note that the brake drum can be removed for servicing the brake without disturbing the universal joint—and the joint can be removed without disturbing drum or the balance of the flange or drum.

If you have a transmission mounting, space, torque, balance or other problem—you are invited to utilize the extensive experience of MECHANICS universal joint engineers.

**MECHANICS UNIVERSAL JOINT DIVISION**  
Borg-Warner • 2030 Harrison Ave., Rockford, Ill.  
Export Sales: Borg-Warner International  
79 E. Adams, Chicago 3, Illinois

# MECHANICS

*Roller Bearing*

# UNIVERSAL JOINTS

For Cars • Trucks • Tractors • Farm Implements • Road Machinery •  
Aircraft • Tanks • Busses and Industrial Equipment

For more facts, use Reader-Reply Card opposite page 18 and circle No. 251

Koehring 34-E paver. A P&H truck-mounted crane used a Gar-Bro 1-yard bucket to place the concrete, which was consolidated by Mall vibrators operated by either a Schramm 105 or Jaeger 185 compressor. Hunt Process Clear was used to cure all concrete.

Backfill compaction around the outlet structure was handled by a crane having a truncated cone of concrete attached to the leads by a rubber tire. Adequate densities were obtained as the crane dropped the concrete weight on backfill placed in layers 12 inches thick.

Cobbles for riprap, grizzled out of the Agua Fria riverbed, were trucked to the site by two FWD rock trucks and four rented Chevrolets. The larger sized riprap was produced at a quarry in the mountains just south of the project. D. W. Jaquays, subcontractor on this work, used a Gardner-Denver Air Trac carriage-mounted wagon drill, Atlas powder, and a Primacord detonating system to get the material out. It was then loaded by a Cat D6 front-end loader and hauled to the job by truck. The same P&H truck-crane that placed concrete was used to place the riprap.

#### Personnel

This work, like all U. S. Army Corps of Engineers' operations in this district, was under the general supervision of Col. Arthur H. Frye, Jr., district engineer, who was assisted by William J. Leen as chief of construction division. The resident engineer was D. G. Putnam, and he was assisted by A. B. Madinger.

Fredericksen & Kasler's operations, headed by general superintendent W. O. Loy, were under the direction of James Fair, dirt foreman; Carl Whitair, structures superintendent; George Shaffer, field engineer; Archie McConnell, master mechanic; and Clarence Black, carpenter foreman. M. H. Whalen was office manager.

THE END

#### Disposable fiber forms eliminate stripping

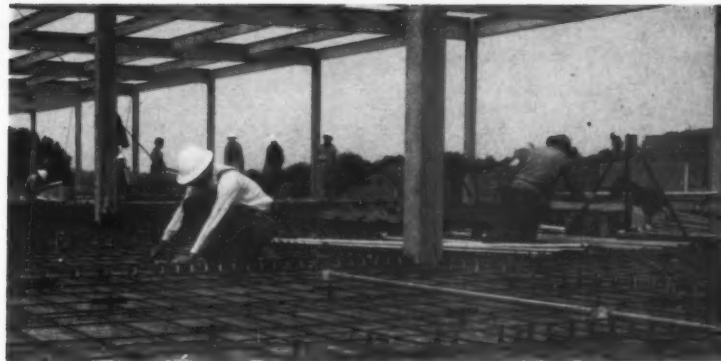
■ Disposable fiber forms for concrete piers, short columns, column footings, and pads are announced by the Delta Co. Deltaform is shipped flat, opens into a square shape, and assumes a cylindrical shape when the concrete is poured.

Deltaform requires no bracing or shoring, according to the manufacturer. One man can carry as many as 25 sections to a job site at one time. Because the form is disposable, stripping is eliminated.

For further information write to the Delta Co., 333 W. 24th Place, Chicago 16, Ill., or use the Request Card at page 18. Circle No. 113.

#### Dorsey's proposed factory

Dorsey Trailers, Elba, Ala., has released plans for the construction of a new factory near the present plant. The plant will triple the production capacity of the firm. The plans were made known at the firm's 45th anniversary convention in Pensacola, Fla.



#### WITH FORMS FOR THE SECOND FLOOR composite slab in place-work-

men install reinforcing steel at the new International Business Machines Research Building in Poughkeepsie, N. Y. Stud-welded shear connectors will support the slab. The form supports have been set in between the flanges of the beams so that the top of the beam is flush. For further information on the shear connectors write to the Nelson Stud Welding Division, Gregory Industries, Inc., 2715 Toledo Ave., Lorain, Ohio, or use the Request Card at page 18. Circle No. 101.



A PCA "Engine-Take-Off" mixer truck—one of 42 IH FC-402-1 Trucks with T. L. Smith Integral Mixers and Fuller 5-C-650 Transmissions.

## FULLER Transmissions all the way for



"We've learned from experience that Fuller Transmissions are by far the most dependable we've ever used," says R. O. Lippi, Manager of San Francisco's Pacific Coast Aggregates, Inc. That's why PCA always specifies Fuller Transmissions on its new mobile equipment.

PCA, one of the largest and most successful aggregates producers in the country, operates 13 producing and 18 batching plants in Northern Cali-

fornia; is a wholesale distributor of building materials.

Fuller 5-C-650 Transmissions are used in PCA's entire fleet of 42 new International "E.T.O." trucks . . . the unique and highly practical "Engine Take-Off" mixer trucks that eliminate the mixer engine and make it possible to carry 6½ cu. yd. payloads within California state weight laws.

Its fleet of 16 diesel powered Wooldridge Terra Cobra wagons, used in the harvesting operation to produce rock, sand and gravel, is equipped with 200 hp HBIS Cummins engines and Fuller 4-speed 4-A-112

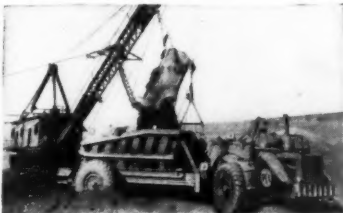
heavy-duty transmissions.

In addition, the entire PCA fleet of 200 trucks is equipped throughout with dependable Fuller heavy-duty transmissions.

On job after job, where loads are the biggest and the going is the toughest, you'll find Fuller Transmissions putting horsepower to work efficiently. Next time you order heavy-duty construction equipment, specify Fuller Transmissions.

From over 110 models available for rubber-tired equipment, you will find a Fuller Transmission designed to do your job.

One of PCA's fleet of Wooldridge Terra Cobra wagons equipped with Fuller 4-speed 4-A-112 Transmissions.



### FULLER MANUFACTURING COMPANY Transmission Division, Kalamazoo, Michigan

Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 252



# Drilling and mucking plan speeds sewage tunnel project

**Use of 5-foot rounds simplifies subsequent work; lifting device switches muck cars on a single track**

An ingenious method of switching muck cars on one track, so that a locomotive can pull empties in and full cars out of the tunnel, plus the use of a 5-foot drilling round are helping to make operations fast and efficient in a new 12-foot horseshoe-shaped sewage-disposal tunnel near White Point, Calif.

This is the last section of the new

outfall tunnel that will connect the Los Angeles County Sanitation Districts' joint disposal plant at Torrance with a new ocean outfall being constructed off White Point. The tunnel is being drilled 8,400 feet under a range of hills, going through soft shale and seams of bentonite. The maximum overburden above the tunnel is 600 feet, and since portions of the ground squeeze or move—from the invert, the top, or one side or another—every foot of construction has to be supported.

Union force-account labor, under district supervision, is removing a 5-foot block of tunnel face with each shot. This 5-foot round results in maximum efficiency in each of the subsequent tunneling steps. First of all, the ground is exceptionally soft, and removal of more than 5 feet of material would create a safety hazard for workmen. Then, excluding about 3,000 feet of very squeezing ground, the tunnel formation is such that 5-foot steel arch braces can be used. This matches the round length. Also, 5 feet of drilling can be done with two to three changes of steel. Finally, the muck pile from a 5-foot round is approximately enough to fill three trains, each composed of six mine cars.

## Other work aids job

Since excavation started in 1955, several other procedures have helped to keep the tunnel work moving. The tunnel invert section is being slightly over-excavated so that a 12-inch cushion of coarse gravel ballast can be laid to support the narrow-gage railroad track and ties. A perforated metal pipe underdrain placed in the gravel ballast and below the rail ties helps drain the length of the tunnel.

Not only water from drills being used, but also water from underground seepage is being carried away with this setup. The usual messy and dangerous mudhole around a tunnel heading has been completely eliminated, boosting the general efficiency of the men. As a result, an average of two and a half 5-foot rounds are completed each 8-hour shift.

## Typical round

The entire drilling job is being done from an adit at the ocean end of the tunnel, because a crosscut connection has to be used at the other end to carry sewage 150 feet to another tunnel paralleling the one being built. Three Joy electric-motor-driven compressors deliver air through a 6-inch header line leading into the tunnel. Also available are a high-pressure water line, and electric power in voltages ranging from 2,300 down. The fan system consists of two Joy in-line 10,000-cfm units, which discharge

CONTRACTORS AND ENGINEERS

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**ALL-WELDED CONSTRUCTION...** including arch of box-section design and one-piece hitch plate and hoist trunnion casting for structural strength and distribution of drag pull.

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1/4 to 40 Cubic Yards

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All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

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One of the Joy Pneumatic drills on the lower level of the jumbo sinks a hole into the tunnel face. About 5 feet of soft rock is torn loose from the heading with each round.



through Naylor 24 and 22-inch spiral-welded pipe.

The 40-hole pattern in the face of the tunnel is started with a 4-hole cut in the center of the face, which is expanded with breast holes, arch or trim holes, relievers and lifters. A two-deck drill jumbo carries the four Joy T-300 mining drills on Joy hydraulic jibs, two machines being located on each level. The rock is generally soft, so that the Timken rock bits being used last for many rounds before they have to be resharpened.

Drillers have simplified their work by sinking a hole to full depth with, whenever possible, only two steel changes. The long steel section is left in the hole until the next drill hole is ready for that steel change. This means that drillers and chuck tenders have to move the heavier steel only about a foot as drill holds are repeated.

A great deal of hand labor is eliminated in this manner. In general, the drill bits penetrated about a foot beyond the 5-foot distance of the round. And the bits angle in so that enough rock is pulled out to leave ample room for the reinforced-concrete invert and walls. Drilling time per round averages approximately 45 minutes.

Loading is done with 40 per cent Trojan powder, two pounds of which are used per cubic yard. Millisecond delays up to and including No. 7 are being used so that shots begin with the cut hole and end with the lifters. Shots are fired off the electric power line inside the tunnel.

#### Fast mucking

One of the most effective features of the tunnel work is the use of a mucking method that calls for some unusual handling of the mine cars.

In such work, safety makes it desirable for trains to be pulled, rather than pushed, into a tunnel. Usually a locomotive pulls a string of empty cars to the tunnel face. Then, as cars are loaded, they are shifted so that they are behind the locomotive when the train is ready to pull out of the tunnel.

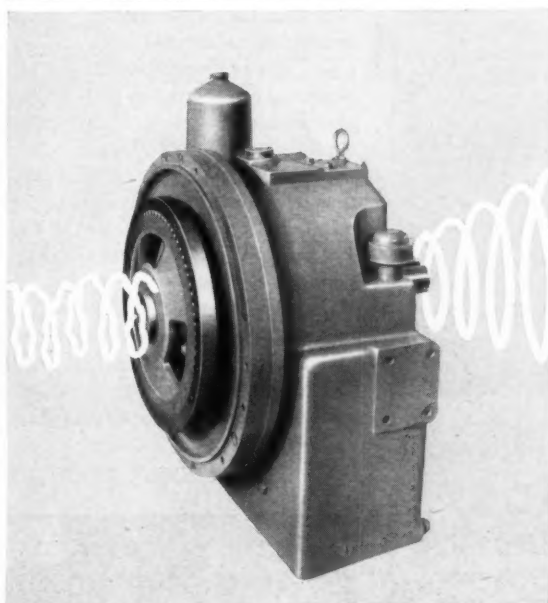
But this 12-foot horseshoe-shaped bore is hardly wide enough at the base to accommodate a California switch or other double-track arrangement. Double tracks are located at every 1,500 feet along the tunnel so that trains can pass each other, but the clearance at these points is very small.

Finding a way to reverse the position of the locomotive and the string of cars on the single track was like trying to solve a puzzle that has no apparent solution. But the supervisors found a way to do it. Deciding that the more than 15 feet of headroom in

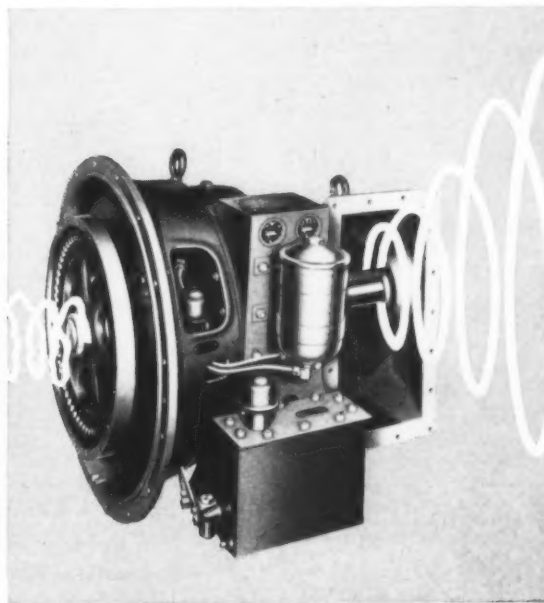
the tunnel was enough so that cars could be lifted over each other, they mounted two large air pistons from the tunnel ceiling. These pistons have a cylinder diameter of 11 inches, a piston-rod diameter of 2 7/16 inches, and a piston stroke of 4 feet, which, because of the method of rigging, lifts a car 8 feet off the track.

(Continued on next page)

## Single-Stage or Three-Stage Torque Converters?



Single-Stage Torque Converter



Three-Stage Torque Converter

The answer to this question depends largely upon the characteristics of the equipment you manufacture or use and the jobs it is required to do. Naturally, many factors must be known before any engineering department can be expected to make recommendations.

Generally speaking, however, when it is desired to have minimum pulldown from governed engine speed—with maximum power output over a wide range—and to produce high torque ratios for hoisting or heavily loaded vehicles, a three-stage torque converter, with torque multiplication up to *six times*, may be most desirable. On the other hand, where mild torque conversion is required, as in certain types of vehicles and in other industrial equipment—a

single-stage converter may be the best choice.

Now, for the first time, you can benefit from the unbiased recommendations of one manufacturer in choosing a torque converter—single-stage or three-stage—with the exact capacity and torque transmission characteristics to give your equipment maximum efficiency.

The Twin Disc Clutch Company's new line of single-stage torque converters—now available in the 1500 Series—complements its time-tested, universally accepted line of three-stage units. Single-stage or three-stage—from 30 to 1000 hp—you can depend on Twin Disc Torque Converters to give your equipment better performance . . . less downtime . . . and greater earning potential.

In addition to offering the most complete—the most versatile line of industrial torque converters available, Twin Disc manufactures fluid couplings in a wide range of sizes for engines and motors from 3/4 to 850 hp, and friction clutches for applications from fractional to 1050 hp.

If your construction equipment requires heavy-duty power transmission components, standardize on Twin Disc—the world's largest manufacturer of fluid and friction drives for powered industrial equipment—for your complete line.

**TWIN DISC CLUTCH COMPANY**  
Racine, Wisconsin  
Hydraulic Division, Rockford, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 254



(Continued from preceding page)

The rigging on the pistons consists of a 3/4-inch wire rope, dead-ended by clamps on the tunnel-support steel, which lead down through snatch blocks to a block on the end of the cylinder piston rod. Snatch blocks also hook to brackets that clamp to the arch steel. Two sets of these brackets are in use. While one is employed in lifting a car, the other is moved ahead so that it is in position when the piston-lifting device is moved forward. The pistons are moved ahead by mine locomotives, which are equipped with brackets on their sides for that purpose.

On the live end of the lifting rope is a hook that grabs a cleat at each end of the mine car for the lift. When

one of the Western side-dump mine cars is to be raised and moved forward, the piston ram is forced in by compressed air and the hook comes up.

At first, there was a little trouble in switching the cars, because the pushing ground sometimes raised the bed of the railroad track. This made the lifting line too long. A chain and hook were put onto the line so that precise adjustments, with even a single chain link, could be made by men hooking up a car.

In operation, the switching system is fast and effective. As a train of six empty cars enters the loading area, the empty car at the end of the train is picked up by the pistons. The Baldwin battery-driven locomotive—one of four on the job—then moves

Broken rock is picked up by a Conway 60 mucker at the heading. At this time, the last car in the train has been set in place between mucker and locomotive, and remaining cars are waiting to be switched and loaded.

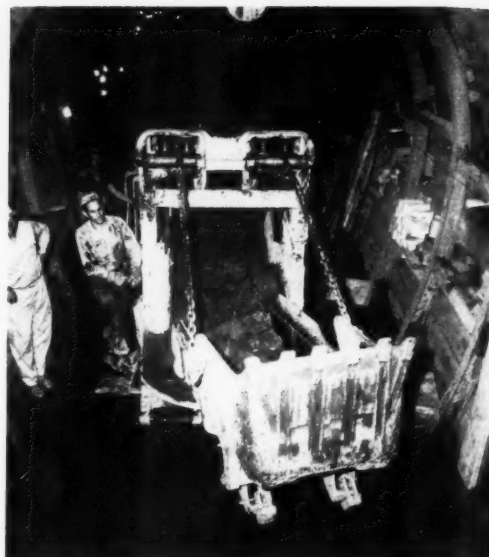


Photo courtesy of Harnischfeger Corp.

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back to the tunnel portal so that there is enough room for the empty to be dropped between the locomotive and the tunnel face. The empty is then shoved to the face to be filled by a Conway 60 mucking machine. A second Conway 60 is kept outside the tunnel portal as a standby.

When the first car is being loaded, the pistons pick a second empty off the end of the train. As the first car is loaded, it is pulled a short distance back from the face so that the second empty can be dropped down on the track, next to the tunnel face. At this stage, the locomotive has three empty cars behind it, a loaded one and a half-filled one in front. The sixth car is held in the air by the piston. The process of shifting the cars is repeated again and again until all are loaded with broken rock and ready to be pulled to the portal by the locomotive. Three such trainloads haul all the broken muck from a single shot.

Outside the portal, the cars are pulled up a short grade by an electric motor-driven winch. A trestle tippie

makes the cars side-dump into the ocean. Trouble in disposing of the muck, which had been expected by project officials, has never materialized because heavy undertows pick up the material almost immediately and carry it southward. The only work necessary so far has been to level the muck pile occasionally with a Caterpillar D7.

After the second blasting round, the 12-inch layer of gravel ballast is extended. This material goes from a 40-cubic yard storage bin directly over the tunnel portal to a manual feeder hopper that loads the mine cars. When it arrives at the tunnel face, the ballast is dumped to the bottom of the tie level. The track is then extended and ballast filled in where needed.

A carload of precut 4x12 Douglas Fir timber is then cantilevered ahead of the 6x6-inch WF Commercial Shearing & Stamping steel arch supports. Workmen, temporarily protected by the cantilevered timber, set the two-section steel arch support that withstands the massive force ex-

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CONTRACTORS AND ENGINEERS

erted by the squeezing ground.

Two redwood blocks—a 6-inch block installed at the crown of the tunnel and a 4-inch block installed at the leg points—are being used in sections where squeezing ground conditions are worst so that all the force of the earth is not placed immediately on the steel. In these places, two 10-inch I-beams, doubled and welded together, are installed at 5-foot centers with redwood blocks at the crown, between the rib butt plates. At each point where the steel support legs meet the invert, a curved steel spreader strut of double 10-inch I-beams is installed to give a good spreading effect.

Despite this work, ground action has distorted even this heavy steel in some places and has made it necessary for some secondary excavation to be done on certain portions of the sides and bottom of the tunnel.

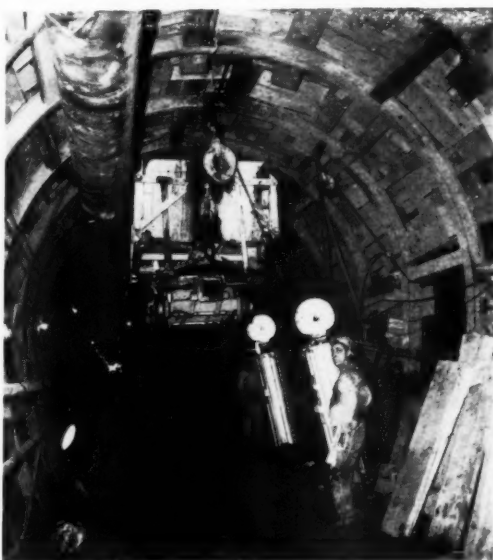
As soon as the steel bracing has been installed, the tunnel face is again ready for drilling.

The entire sequence of operations

is going smoothly, largely as a result of the well-organized work methods on this job. On an average, it takes 45 minutes to drill the tunnel face, 15 minutes to load powder, 5 minutes to remove smoke from the face with the fan and ventilator system, and 15 minutes to install crown bars. Added to this is 45 minutes for mucking operations, 15 minutes for track laying, 15 minutes for setting steel tunnel ribs, and 15 minutes for installing timber supports behind the steel. Since the workmen actually work seven out of eight hours, about 2½ rounds are completed each shift. This amounts to a total of 5 rounds for both shifts in a single day.

At the current rate of progress, excavation should be finished by late fall, permitting work to start on the 17 to 26-inch reinforced-concrete lining. The tunnel is expected to be completed six to eight months after work ends on the distribution structure on the shore and the outfall line that runs out into deep water.

THE END



▲ Workmen demonstrate the piston-controlled "cherry picker" used to pick up the last mine car from a train at the heading. After the locomotive pulls a short way to the portal, the last car is picked up and set back on the tracks between the mucker and the locomotive.

After every two rounds, a 12-inch layer of gravel is laid along the invert to support the ties and track. Perforated pipe in this gravel ballast drains off water from the heading.



## A cleaner sweep... at lower cost... with the **LITTLE GIANT** Road Bird



Power-driven brush sweeps dirt, trash, rock, gravel and snow from any surface in one pass. Flexible construction absorbs road shocks and irregularities, lowering maintenance costs, prolonging sweeper life. Minimum weight reduces pull-power requirements. Short wheel base permits turns in tight quarters.

With all these features, the Little Giant Road Bird costs less to buy and use. Ask your nearby Little Giant distributor or write direct.

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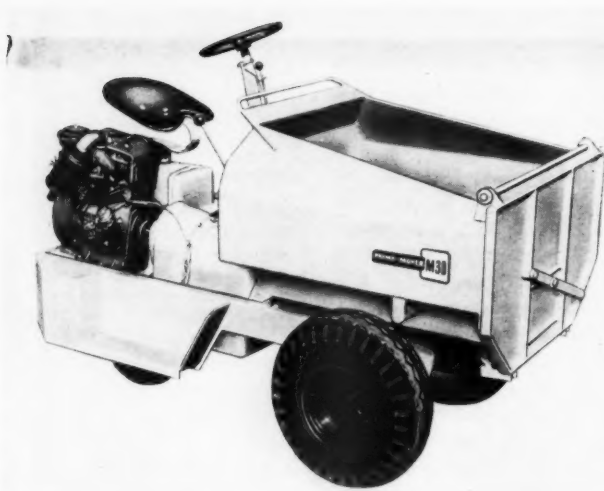


## Material-handling truck with torque converter

■ A 1½-ton-capacity material-handling truck with torque-converter drive has been introduced by The Prime-Mover Co. According to the manufacturer, this is the first such unit specifically designed for the construction field to incorporate a hydraulic torque converter.

The new truck has a top speed of 12 mph, and is capable of hauling 18-cubic-foot loads. It is powered by a Wisconsin 15-hp air-cooled engine direct-coupled to a transmission consisting of a three-element torque converter and directional change clutches.

Wear and tear on all mechanical parts is said to be cushioned by the



The new model M30 Prime-Mover sports torque-converter drive.

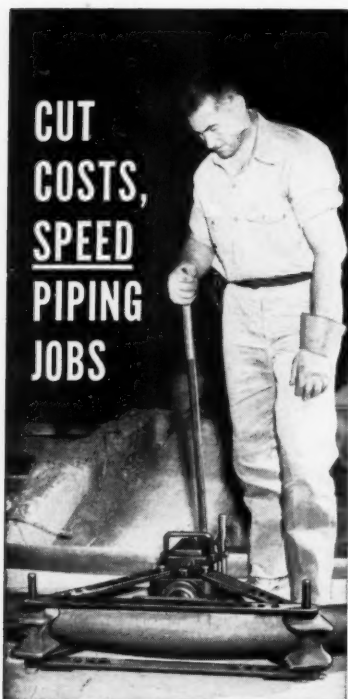
hydraulic torque converter, and maintenance is simplified by having most parts immersed in oil. Smooth starts and acceleration reportedly eliminate spillage of liquid loads or shifting of stacked materials. The steady flow of power takes steep inclines or inches slowly for accurate spotting and placing of loads, according to the manufacturer.

The Model M30 Prime-Mover is engineered for speedy delivery of building materials in quantity on long-haul jobs, such as bridge, pier, and airport projects. Standard beds avail-

able include the 18-cubic-foot bulk-handling bed and a 42×42-inch flat-bed. The bulk-handling bed has a sliding endgate, swinging tailgate, and dumping controls to accommodate any rate of load discharge.

Over-all width of the M30 with bed is 42 inches and over-all length is 88½ inches. Height to top of bulk bed is 42 inches.

For further information write to The Prime-Mover Co., Sampson St., Muscatine, Iowa, or use the Request Card that is bound in at page 18. Circle No. 68.



## ...with Greenlee Hydraulic Pipe and Conduit Bender

Built for the tough jobs, the GREENLEE Bender saves hours, reduces costs on your pipe and conduit work. With a GREENLEE one man quickly makes bends in pipe up to 5", rigid and thin-wall conduit *right on the job*, exactly where and when needed. Many owners report time and labor savings of 50% or more... and the cost of many manufactured bends and fittings is entirely eliminated. Compact, portable, versatile to reduce your costs, eliminate construction delays, keep jobs rapidly moving along on schedule. Available in two sizes. Thousands in use by construction crews, electricians and plant maintenance departments. Often pays for itself on the very first job!

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**GREENLEE TOOL CO.**  
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For more facts, circle No. 259



## Your new Pump Manual is ready

Prepared for pump users and specification writers, the new Contractors Pump Manual gives the recently increased performance standards for A.G.C. Rated pumps, and 22 additional pages of helpful information on the selection and operation of contractors pumps.

If you do not yet have a copy, send in your request today. It will bring you up-to-date with the advances of an industry which is dedicated to progressive improvement in its standards and practices.



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**STERLING MCHY. COMPANY**  
Los Angeles, Calif.  
**WORTHINGTON CORP.**  
Contractor's Pump Division  
Plainfield, New Jersey



For more facts, use Reader-Reply Card opposite page 18 and circle No. 260

## Vane-shear readings

■ In-place vane-shear reading tools for testing to depths of 100 feet are detailed in a bulletin from Acker Drill Co., Inc. A complete tool kit, containing tools that can be used within 2½, 3, and 4-inch casing and attached to standard size "A" rods, is pictured. With special adapters, "E" drill rods or standard pipe sizes can be used. The step-by-step process of the test is pictured. A cross-section view of the tester in place is given, as well as the correlation chart, which converts torque observed to the shear strength of the material being tested.

To obtain Bulletin 700 write to Acker Drill Co., Inc., 725 W. Lackawanna Ave., Scranton 3, Pa., or use the card at page 18. Circle No. 141.



## But why MEN over 45?

Our doctors still don't know *why*, but if you are a man over 45 you are six times as likely to develop lung cancer as a man of your age twenty years ago. They *do* know, however, that their chances of saving your life could be about *ten times* greater if they could only detect cancer long before you yourself notice any symptom. (Only 1 in every 20 lung cancers is being cured today, largely because most cases progress too far before detected.)

That's why we urge that you make a habit of having your chest X-rayed every six months, no matter how well you may *feel*. The alarming increase of lung cancer in men over 45 more than justifies such precautions. Far too many men die *needlessly*!

Our new film "The Warning Shadow" will tell you what every man should know about lung cancer. To find where and when you can see this film, and to get life-saving facts about other forms of cancer, phone the American Cancer Society office nearest you or simply write to "Cancer"—in care of your local Post Office.

**American  
Cancer  
Society**

For more facts, circle No. 261

**CONTRACTORS AND ENGINEERS**



### Self-propelled paver lays up to 60 feet per minute

■ An asphalt paver designed to lay all types of material in from 8 to 10-foot widths, ½ to 4 inches thick, is available from the Trac-Machinery Co. The Trac Paver is self-propelled and can push batch trucks while operating.

Paving speeds run from 5 to 60 feet per minute. The machine has five forward speeds and one reverse. Through the use of hydraulic control, the operator can change the speed within the gear range without changing the engine rpm.

The machine can travel over the road at speeds to 20 mph. Liberal use of hydraulics eliminates many working parts. The Trac Paver has hydraulic power steering, a hydraulically operated screed, a hydraulic material-flow control rudder, and a hydraulic screed lift.

For further information write to the Trac-Machinery Co., Nunda, N. Y., or use the Request Card at page 18. Circle No. 77.

### New auger attachment drills up to 40 feet

■ A new auger attachment for use on the Model H-3 and H-5 Hydrocranes has been announced by the Bucyrus-Erie Co. According to the manufacturer, the new unit drills holes up to 28 inches in diameter. Maximum depth capacity is 40 feet.

The attachment consists of a cutter head, 4-foot auger flight sections, a hydraulic motor and gear box, a torque arm extending from motor bracket to boom, and drain hose.

Auger diameters range in size from 3 to 28 inches. The cutter heads are fitted with long-wearing, sharp, carbide teeth. Specially-designed heads for drilling various types of materials are available.

For further information write to the Bucyrus-Erie Co., South Milwaukee, Wis., or use the Request Card that is bound in at page 18. Circle No. 71.

### Aeroil Products moves Chicago office, warehouse

The Chicago, Ill., branch office and warehouse of Aeroil Products Co., Inc., South Hackensack, N. J., has been moved to 4648 S. Western Ave. Robert H. Willems is midwest regional manager, and Walter F. Vendenberg, branch manager for Aeroil, manufacturers of equipment for roofing, construction, and road building.

The Trac Paver makes liberal use of hydraulics, thus eliminating many moving parts.

### New diamond blades cut abrasive block

■ A new line of carbide-bonded diamond blades is available from the Consolidated Diamond Tool Corp. for high-speed, wet cutting of abrasive block.

According to the manufacturer, the carbide-bonded blade will not only cut far more blocks per blade, as compared to ordinary diamond blades, but will also cut abrasive blocks many times faster.

The new line of blades is recommended for such abrasive blocks as Haydite, Waylite, cinder block, concrete block, and granite block (cinder block with a simulated tile or marble facing).

For further information write to



Consolidated Diamond Tool Corp., 320 Yonkers Ave., Yonkers, N. Y., or use the Request Card at page 18. Circle No. 79.

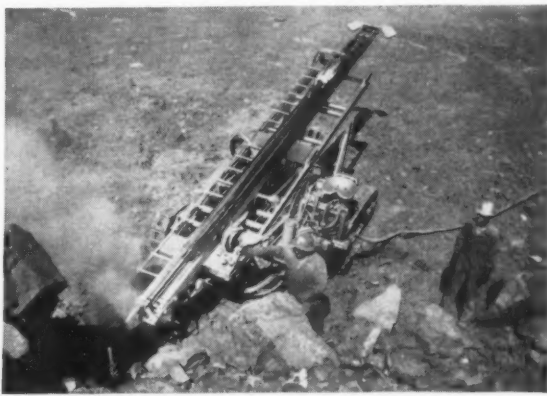
## Gardner-Denver... Serving the World's Basic Industries



Self-propelled "Air Trac"® drill for rough terrain.



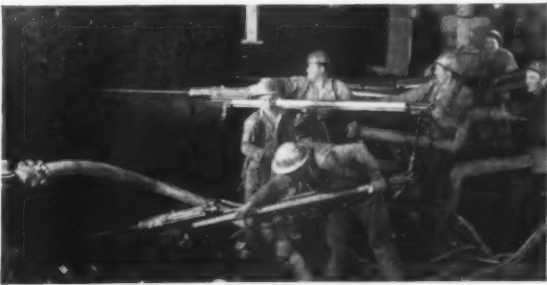
Hydraulic booms and remote-controlled drills for mounting on tractor truck or half-track.



New 5½" heavy-duty rock drill on self-propelled crawler.



All-weather rotaries in 600-foot and 900-foot capacities.



Long-feed tunnel drills and hydraulic booms.

## Cost-saving tools for the big push

When you come to rock... come to Gardner-Denver for cost-cutting rock drill equipment. Ask for bulletins.



## GARDNER - DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois  
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There's a Gardner-Denver distributor in your area—  
see him for details

For more facts, use Reader-Reply Card opposite page 18 and circle No. 262



**Contract work, equipment rental, and force-account method are used in**

## Enlarging sewage-discharge facility

The maximum in economy is being achieved on the \$7 million expansion of a major sewage-discharge facility in Los Angeles County, Calif., which is being built with the Sanitation Districts of Los Angeles County assuming what would normally be a contractor's risk.

Work on the tunnel and outfall line at White Point, between the Torrance, Calif., joint disposal plant and the Pacific Ocean, is already far enough along to show that a good facility will be provided at a low cost.

The excavation job for an 8,400-



Gantry cranes ride on the trestle used by Healy-Tibbits Construction Co., San Francisco, in the construction of the first 1,000 feet of the outfall line.

foot tunnel, which had been bid at a low contract figure of \$3,877,500, is being done by force account because the engineer's estimate was \$3,100,000. Lester Haug, the man who prepared the estimate, is construction engineer and superintendent in the field, and his progress and costs to date appear to justify the district estimate.

The low bid for extending the new 90-inch-diameter outfall line 9,200 feet into the Pacific, where water goes 215 feet deep, came to \$2,124,100 as compared to the engineer's estimate of \$1,345,000. The pipe was to be furnished by the Districts, so the \$873,555 cost of the pipe did not figure in the contract vs. force-account case. The Districts' decision here was to let the low-bid firm of Healy-Tibbits Construction Co., San Francisco, Calif., do \$484,800 worth of work on the first 1,000 feet of the outfall line. The remaining portion is being done by District force account.

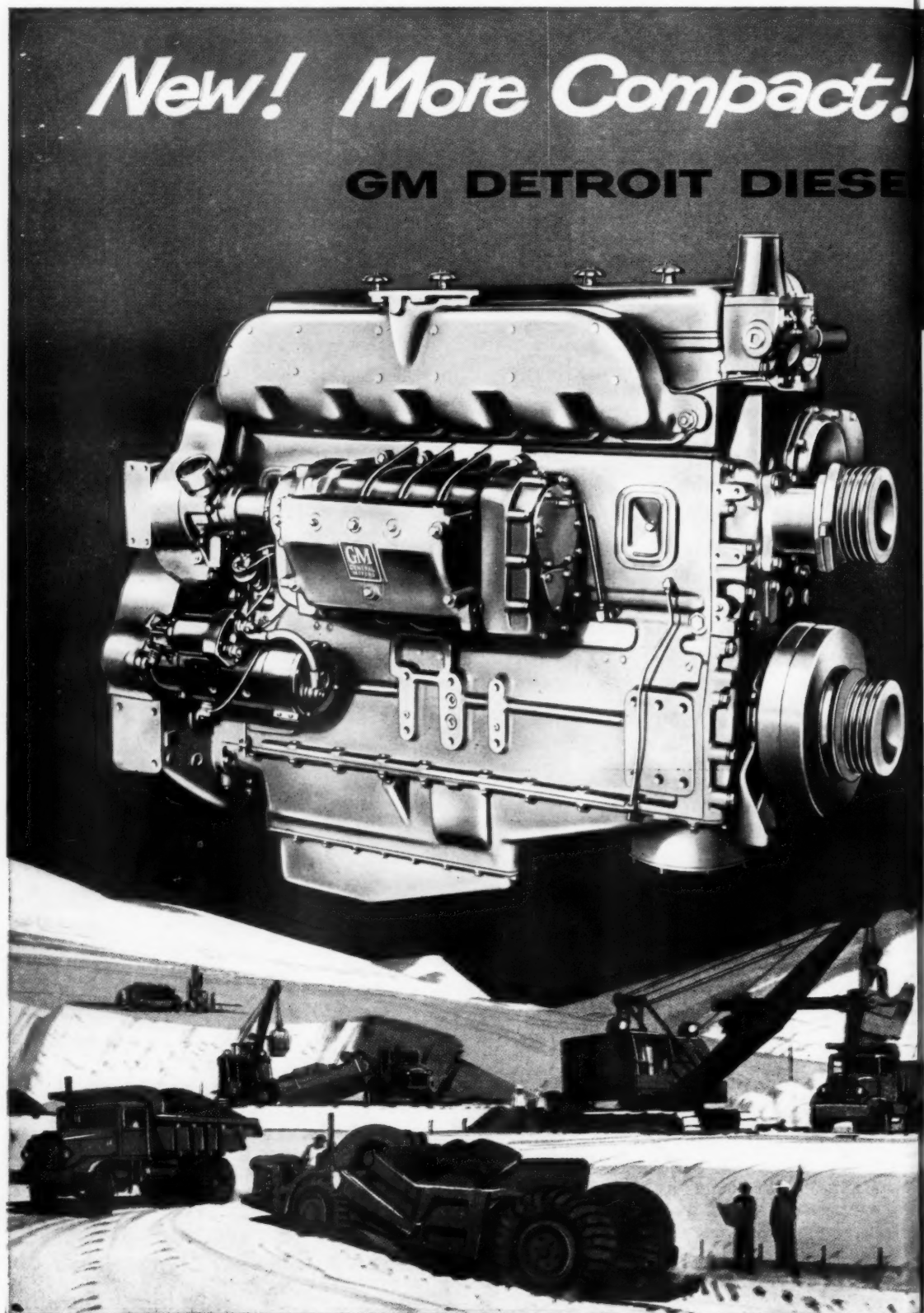
Under this type of operation, all major items of floating equipment for use on the ocean were leased on an

operated and maintained basis, mostly from the contractors that had bid on the work. The Districts, in effect, have taken over the management, supervision, and risk of doing a job far outside a protected harbor.

This arrangement is not as surprising as it might seem, considering that about half the tunnel work in the county during the last decade has been done by experienced tunnelmen on the District payroll; and that the record for deep-water installation of an outfall line—160 feet—was established by divers working under District supervision. The District has as good a pool of experienced men to use as the contractors.

### Expansion needed

The current expansion work is



badly needed. The tremendous increase in population—due to an influx of people and a higher birth rate—has made it necessary for the Districts to provide facilities that are more than adequate for the residents of the area.

Sewage lines are already complex: draining into the joint disposal plant at Torrance are lines from Altadena, Pasadena, Long Beach, and Manhattan Beach; lines from cities and towns along the Orange County line; and even lines from points as far away as Pomona.

The sewage-collection systems have grown to keep ahead of the needs of the population, but additional work in the area between the joint disposal plant at Torrance and the ocean outfall has always lagged.

#### Successive enlargements

In 1937, a 6½-mile tunnel, 8 feet in diameter, was built between the disposal plant and the shore. A 60-inch-diameter outfall pipeline was laid out into the ocean from this point. This early system developed a discharge capacity of 70 mgd—an amount high for that time.

During the last years of World War II, the system became severely overloaded, and by the time the war was over in 1945, it had become apparent that the facility would have to be enlarged. A 72-inch ocean outfall pipeline, added to the system in 1947, went 5,000 feet out into the ocean. This boosted the discharge capacity to 120 mgd. Then in 1954, this 72-inch line was extended to 7,000 feet.

Even as the outfall pipeline was

being extended, officials knew the system would have to be enlarged again. The facility was being taxed so much that some trunk lines were being used for temporary storage during peak sewage flow and drained clear after 10 p.m. when peak flows subsided. A new tunnel, paralleling the old one, and a new sewage outfall line reaching out into the ocean were clearly needed.

The current work has been programmed so that parts of it will be ready for use even before the entire project is finished. First, 5,000 feet of 12-foot-diameter pipe was built, reaching from the joint sewage-treatment plant toward the range of hills between plant and ocean. The 12-foot-diameter horseshoe-shaped tunnel—which is still under construction

was then driven from a 3,500-foot portal located at the end of this pipe so that a 150-foot cross-connection could be made to the old tunnel. Both this part of the tunnel section and the cross-connection were lined with concrete so that part of the new pipeline and tunnel could be placed in service.

The effect has been to reduce the friction loss to the cross-cut location by operating the 8-foot and 12-foot lines in parallel flow between the joint disposal plant and the cross-connection. Daily capacity jumped immediately to 150 mgd, even though the remaining portion of the tunnel and the new outfall line are still under construction. The increase in hydraulic head at the cross-cut location simply forces more flow out of the existing 60 and 72-inch ocean discharge lines.

#### Present construction

Two similar cross-cut passageways have been made between the old and new tunnels, increasing the discharge capacity from 150 to 200 mgd, and from 200 to 220 mgd, respectively.

Construction of a \$109,413 concrete manifold structure by R. C. R. Corp., El Monte, Calif., will permit both tunnels to be used, along with any combination of the outfall line. When the new tunnel is completed late this fall, and the manifold structure and 12-foot outfall pipeline go into operation, discharge capacity should go up to 400 mgd.

The new ocean outfall line will be 90 inches in diameter, and consist of reinforced-concrete pipe sections with 8-inch-thick walls and rubber and lead gaskets. Pipe joints will be 24 feet long, and each section will weigh 32 tons. The outfall will reach 8,000 feet into the ocean, terminating in water that goes 200 feet deep. Here, a wye will be located. Beyond it, two branch lines, each 1,200 feet long and 60 inches in diameter, will extend into water 215 feet deep. Sewage will be diffused through an opening in each joint of the branches. A concrete casing, gravel ballast, or both, will protect the entire line from scour damage.

#### Personnel

The big expansion program is under the direction of A. M. Rawn, chief engineer and general manager for the Sanitation Districts of Los Angeles County. Lester Haug is construction engineer and superintendent in charge of field work. Other key field personnel include Don Schmid, field engineer; Dan Boom, who is in charge of all offshore outfall work; and Harry Panaccione, supervisor of tunnel work.

THE END

#### Charles Bruning plans new manufacturing plant

A new plant—more than double the size of its two Chicago plants—will be built in Mount Prospect, Ill., by the Charles Bruning Co., Inc., Chicago, Ill. To be located on a 30-acre plot and to have a total 275,000-square-foot area, the new plant will replace present facilities.

# More Versatile!

## 300-H.P. SERIES 110 ENGINE

Now available to fit a broader range of power equipment

Now the best 300-horsepower Diesel is even better than ever—ready to step up production and cut costs on any job you name.

It's the time-proved General Motors Series 110 Diesel, newly equipped with a side-mounted blower similar to the one used on the famous 71 Series. It's a more compact engine. It's shorter. It's lower. It fits more applications than ever before.

You can have this new GM Detroit Diesel Series 110 engine installed in off-highway trucks and move bigger loads faster.

You can use it to increase the power of heavy crawler tractors, scrapers and air compressors—get more work per day and per dollar.

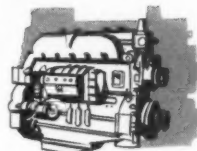
And, in practically no time at all, you can have this new Series 110 Diesel installed in almost any 3-yard shovel—to move earth faster at less cost.

The new blower makes the Series 110 engine far more versatile—available with either right- or left-hand rotation, and a wider range of accessory drive outlets—four accessory drives on the rear of the engine, and four fan-mounting positions on the front.

This new Detroit Diesel Series 110 engine takes on all comers in operating efficiency. It's a leader in work output per dollar. Let your local GM Detroit Diesel Distributor or Dealer show you what we mean.

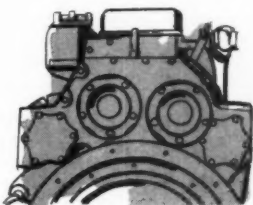
#### New Compactness—

The side-mounted blower eliminates former style blower at the end of the Series 110 engine and also cuts down height. Easier to install—easier to maintain.



#### New Flexibility—

Four accessory drive outlets on rear of engine. You can direct drive both a hydraulic pump and an air compressor off the engine at the same time. New gear train features wider gears with increased helix angle for longer life. Blower and camshaft loads are split.



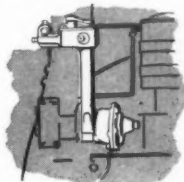
#### New long-life Cylinder Head

Has many design improvements, including integral water manifold and drilled passages for rocker-arm lubrication. Water manifold studs and gaskets eliminated. Outside rail gives extra rigidity.



#### New Governor

Is more easily serviced—utilizes many Series 71 parts. Provides for tachometer drive. An accessory drive may also be taken off the governor drive gear.



## DETROIT DIESEL

Engine Division of General Motors, Detroit 28, Michigan

Single Engines . . . 30 to 300 H.P. Multiple Units . . . Up to 893 H.P.  
In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario

AMERICA'S LARGEST BUILDER OF DIESEL ENGINES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 263





The new Model 95 Payhauler has a 24-ton hauling capacity and speeds to 38 miles per hour.

## Crawler-mounted tractor-shovel, off-highway hauling units introduced by International

■ A unique, integrally-designed tractor-shovel on crawler tracks and two heavy-duty, off-highway hauling units have been unveiled by the International Harvester Co. and are now in production.

The three brand-new items were demonstrated recently at a special press preview held at International's Dundee, Ill., proving ground.

The International Model Payloader,

essentially a track-mounted version of the Hough rubber-tire Payloader, represents a considerable advance in the design of a better balanced track-type tractor-loader, the company feels. The rear-mounted engine acts as a counterweight, giving optimum weight distribution through the full length of the crawler tracks.

The 1¼-cubic-yard hydraulically-actuated bucket on the Model 12 features 40-degree tip-back at ground level and an 8-foot 10-inch discharge height, as well as high break-out.

The machine's power train includes an International UD-350 diesel engine developing 91.5 horsepower, full power-shift transmission, and torque-converter drive. Power-boosted steering controls—including a separate, hydraulically-controlled steering clutch for each track—are conveniently grouped in front of the operator, whose seat is in the middle of the machine. Seated over the center of the track frames, the operator not only has greater visibility but also enjoys a more comfortable ride. The foam-rubber seat is adjustable.

This new Payloader is mounted on International's TD-9 track assembly, with extended track frames equipped with 15-inch-wide low-profile grouser shoes.

Speed and maneuverability are also special features of the new machine. Three forward speeds range from 0 to 10.1 mph, and three reverse speeds range from 0 to 13.1.

Unusual service accessibility has been incorporated into the machine's design. Removal of two pins at the rear of the loader and release of two screws at the front allows the body to be tilted up and forward so that the rear deck on the main frame is exposed. Both the main frame and the bottom of the engine may be easily serviced with the loader in this position.

The new Payloader is 7 feet 2 inches wide, has a ground clearance of 11 feet 4 inches, and weighs approximately 20,800 pounds.

International's new off-highway hauling units, Payhauler Models 65 and 95, represent the company's initial venture into the off-highway hauling field. Both are end-dump models. The Model 65 has an 18-ton capacity; the Model 95 a 24-ton capacity.

The outstanding feature of the new Payhaulers, according to the manufacturer, is the fact that they have greater horsepower-to-payload ratio than that available on other off-highway trucks. Stronger main frames, reduced maintenance cost, higher speeds, full power hoists, and greater visibility are also important advantages.

The Model 65 is powered by a Cummins turbocharged diesel engine de-



## Hammer Life Increased 7 Times by HARD-FACING

Hammers used to crush limestone and shale remain in operation for 70 weeks now that they are protected with HASCROME high-chromium rod. Unprotected hammers are completely unserviceable after operating for only 10 weeks under the same conditions. The usual maintenance procedure is to recondition the hammers with HASCROME rod about every two weeks—after they have crushed approximately 13,000 tons.

Hard-facing proved to be the economical solution to this typical problem of severe impact and wear. Periodic rebuilding with inexpensive HASCROME iron-base rod resulted in one hammer doing the work of seven, thus saving the cost of six new hammers.

HASCROME rod is widely used to protect rock crushing

and earth moving equipment because of its resistance to severe shock and impact. It is a tough alloy which work-hardens to Rockwell C-50, and doesn't chip or spall under heavy impact. The ability to resist mushrooming makes HASCROME rod an excellent build-up rod, too. It provides an excellent shock-proof base for harder, more corrosion-resistant HAYNES hard-facing alloys when severe abrasion or corrosion is the major problem.

See your local dealer for more information on the complete line of 18 HAYNES hard-facing alloys. One of them will solve your wear problem. If you don't know the location of your dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

See...

Your local Haynes Stellite Dealer

or

Write...

to Haynes Stellite Company

"Haynes" and "Hascrome" are registered trade-marks of Union Carbide and Carbon Corporation.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 264

The International Model 12 Payloader represents a new advance in integral design of crawler-mounted tractor shovels.



veloping 250 horsepower at 2,100 rpm. Available with either five or ten-speed transmission, this unit has a top speed of 36½ mph. Wheelbase is 13 feet 2 inches; over-all length is 24 feet 11 inches; over-all width is 10 feet 8¾ inches; over-all height is 11 feet. Loading height is 9 feet. Weight is approximately 40,000 pounds. Its turning radius is 29 feet 3 inches.

The Model 95, powered by a 335-hp Cummins turbocharged diesel, has a 13-foot 9-inch wheelbase, 26-foot 1-inch length, 11-foot 6-inch width, and 9-foot 2-inch loading height. Turning radius is 30 feet 5 inches. Weight is approximately 47,000 pounds. Equipped with a nine-speed transmission, this model has a top speed of 37.2 mph, and an optional torque converter and power-shift transmission bring the top speed to 38 mph. Either a quarry or standard body is available.

Both models have 65-degree dumping angles, and hydraulic double-action hoists raise the bodies quickly. Tubeless tires and 125-gallon fuel tanks are standard equipment.

For further information on the new International Payloader and Payhaulers write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card that is bound in at page 18. Circle No. 105.

#### Replacement tire valves installed hot or cold

■ Rubber-base replacement tire valves designed to be applied either cold or hot have been developed by the Bridgeport Brass Co. The new valves, recommended for use on truck and tractor tubes, are said to provide an equally positive valve-to-tube bond whether they are applied cold or with heat.

Application of the valves is said to be a simple operation. The tube is first prepared in the usual manner. For cold bonding, the valve is positioned and stitched on thoroughly after removal of the pre-scored protective covering. For hot application, the vulcanizing procedure for ordinary replacement valves is followed.

For further information write to the Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 95.

#### Weigh system changes force to pressure

■ The capacity to operate successfully under extremely rugged and adverse conditions is claimed for the EC weighing system manufactured by The A. H. Emery Co. Recommended for bin, tank, platform, and conveyor weighing applications, Emery systems can also be used to measure, indicate, and actuate control mechanisms for automatic operations.

The EC system converts force into hydraulic pressure. This pressure is then used to actuate an indicator, recorder, or controller. The system can be used in any position, and no bell cranks or levers are necessary.

The unit is sensitive to one part in 10,000. It is calibrated to 1 per cent

of load range and is available in capacities ranging from 5,000 to 100,000 pounds. The cells can take cross or off-center loads.

For further information write to The A. H. Emery Co., Pine St., New Canaan, Conn., or use the Request Card at page 18. Circle No. 97.

#### LeTourneau-Westinghouse names district salesman

Covering eastern Tennessee, northern Alabama, and all of Kentucky as district sales representative of the LeTourneau-Westinghouse Co., Peoria, Ill., is Pat McNulty. He will work with distributors in the area.

McNulty, a graduate civil engineer, has been associated with LeTourneau-Westinghouse since 1954.

## Advanced hydraulics boost production with GarWood Buckeye ditchers!



**EXCLUSIVE LIVE HYDRAULIC WHEEL HOIST** positions digging wheel faster, more accurately and independent of all other operations. Instantly operated from seat by simple, one-hand controls.

**EXCLUSIVE HYDRAULIC CONVEYOR DRIVE** provides three discharge speeds in either direction... instant adjustment to handle any volume of spoil independent of any other function. No complicated shifting, no need to stop digging wheel or crawlers. Completely controllable from the seat.

These and other Buckeye features mean smooth, clean, low-cost ditching... more ditch per dollar with the greatest return on your capital investment. They also mean longer life, less maintenance and less downtime.

Find out more about these advanced Buckeye models: the 305, 307 and 308. See your Gar Wood-Buckeye dealer, or write to: Customer Service Department, Gar Wood Industries, Inc., Wayne, Michigan.

#### MORE FOR YOUR MONEY!

**TRACTOR-TYPE CRAWLERS** give long, trouble-free service life... simplify variation in tread width and bearing areas through a selection of pads for any type digging.

**SIMPLIFIED GROUP CONTROLS**, with panel-mounted conveyor and hoist controls, foot-operated steering controls. Control arrangement helps operator adjust to changing digging conditions faster, easier.

**UNIT CONSTRUCTION** provides interchangeability of major components and assemblies of all three new models.

**TAPERED ROOTER BITS** fit inside holders, are pitched for proper bit angle and bucket heel clearance. Last longer... can be replaced easier and at a much lower cost.

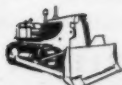
### GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Findlay, Ohio

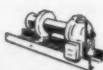
Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.



Gar Wood Excavators



Gar Wood Tractor Equipment



Gar Wood Winches



Gar Wood-Buckeye Finegraders



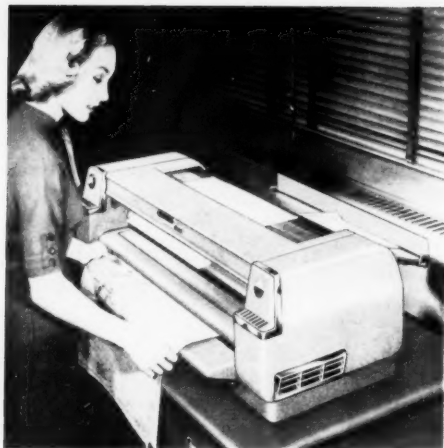
Gar Wood-Buckeye Ditchers



Gar Wood-St. Paul Hoists & Bodies

For more facts, use Reader-Reply Card opposite page 18 and circle No. 265





The Bruning Copyflex Model 300 has a variable speed drive and will handle up to 106 inches of 30-inch wide copy per minute.

## New reproduction machine has variable-speed drive

■ A table-top diazo reproduction machine—primarily designed to provide "inside" reproduction facilities—has been introduced by Charles Bruning Co., Inc.

The new machine, known as the Copyflex Model 300, includes the following features: 30-inch printing width, top mechanical speed of 106 inches per minute, variable-speed drive with 100,000-hour-life-rated selenium rectifiers, 1,200-watt quartz lamp with 34-inch active length, and a 12×30-inch rear delivery tray. The machine operates on a 115-volt, 60-cycle, 17.2-amp alternating current.

The Model 300 is a completely self-contained unit needing only an electrical connection for operation. It does not require any vents, darkroom facilities, or auxiliary equipment. The machine is 15 inches high, 45½ inches wide, and 31 inches deep (including rear delivery tray.) The cabinet is made of 18-gage steel and is finished in two-tone hammertone baked enamel.

For further information write to Charles Bruning Co., Inc., 4700 Montrose Ave., Chicago 41, Ill., or use the Request Card at page 18. Circle No. 69.

## Power pump increases hydraulic jack speed

■ An increase in the operating speed of hydraulic jacks and pullers is achieved with the use of a new electric hydraulic power pump, according to the manufacturer, Templeton, Kenly & Co. The new unit, known as the No. 798 CO, will raise a Simplex Re-Mo-Trol 60-ton-capacity ram five times faster than a hand pump—lifting the ram 1 inch in half a minute as compared to 2 minutes with a hand pump, the manufacturer reports.

The electric pump has a displacement of 30 cubic inches of oil per minute at 10,000 psi, compared to a hand pump's displacement of 6 cubic inches per minute at approximately 30 strokes.

The new No. 798 CO electric pump, when used with Simplex Re-Mo-Trol single or two-way rams, provides combination units with capacities from 10 to 100 tons for lifting, pushing, or pulling heavy loads. The setup exerts force in any direction, while the operator remains a safe distance away. It is recommended for lifting and lowering machinery, aligning beams, straightening buckets and forms, and prestressing concrete. For further information write to Templeton, Kenly & Co., 16th St. and Gardner Road, Broadview, Ill., or use the Request Card at page 18. Circle No. 70.

## Announce expanded bucket elevator line

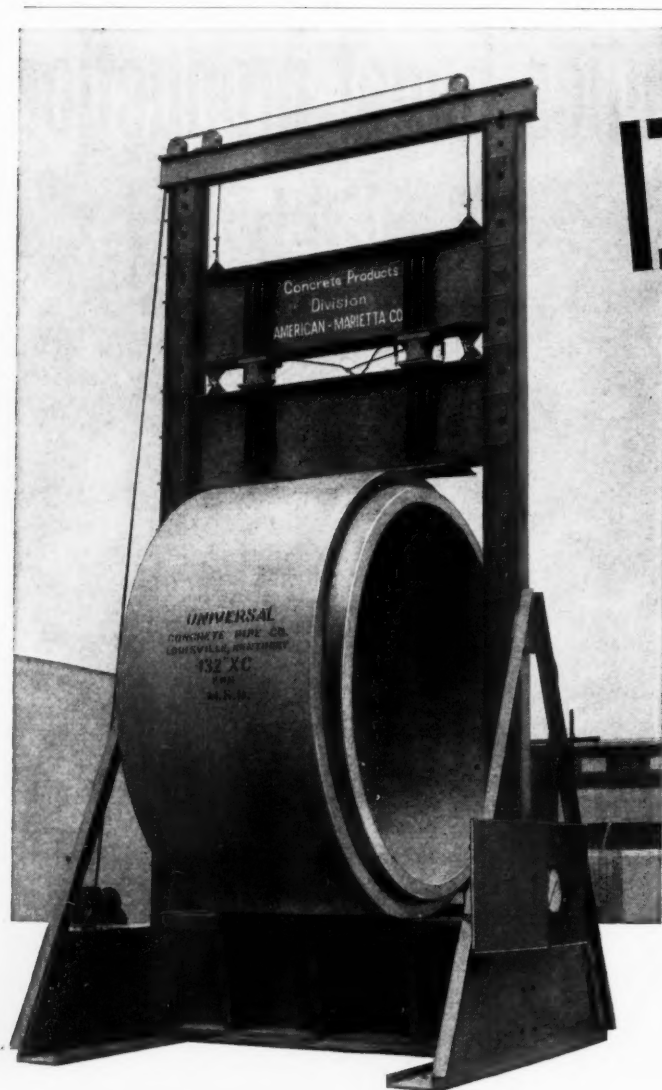
■ A broadened line of bucket elevators in capacities up to 1,600 cubic feet per hour has been announced by The Fairfield Engineering Co.

Fairfield bucket elevators handle up to 80 tons per hour of lump sizes to 4 inches, and are available with two-way hoppers. Such features as clean-out doors, removable bottom plate, and reversible chute make for simplified maintenance and long life, according to the company.

The elevators are available in 10 to 60-foot heights. All types of feeders are offered, and either belt or chain-type units are available.

For further information write to The Fairfield Engineering Co., Barnhart St., Marion, Ohio, or use the Request Card at page 18. Circle No. 7.

CONTRACTORS AND ENGINEERS



Pipe section under test is 132" in diameter, six feet long, with a 12" wall thickness.

# PROOF!

## through pre-testing...

### Large diameter pipe and high strength can go together!

Stop the guesswork... install American-Marietta Company concrete pipe of pre-tested strength. To prove the strength of large diameter A-M pipe, we will gladly test pilot sections under your supervision on our special machines.

Another plus—precasting under factory control means an accurate proportioning of quality materials—with a strict adherence to design specifications—remote from the hazards of trench construction.

American-Marietta Engineers will aid in the design of precast concrete pipe sections to meet special requirements in sizes from four inches through 144 inches in diameter—then pre-test the section to guarantee the strength of the design.

*Our technical staff will be pleased to assist you  
with any of your pipe problems*



## AMERICAN-MARIETTA COMPANY CONCRETE PRODUCTS DIVISION

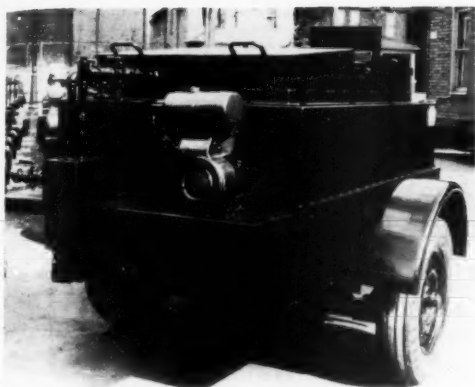
GENERAL OFFICES:

AMERICAN-MARIETTA BUILDING,  
101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS PHONE: WHITEHALL 4-5600

### DIVISIONS AND SUBSIDIARIES

B. C. Concrete Company, Ltd.	Concrete Products Co. of America	Lewistown Pipe Company
Atlantic Concrete Pipe Co.	Lamar Pipe and Tile Company	Universal Concrete Pipe Co.
Tellyer Concrete Pipe Co.	American-Marietta Company of Pennsylvania	

For more facts, use Reader-Reply Card opposite page 18 and circle No. 266



The new portable four-barrel-capacity tar kettle produced by Chausse Mfg. Co., Inc., of Detroit, Michigan.

### Portable tar kettle has power spray unit

■ A new portable tar kettle with a capacity of four barrels is available from Chausse Mfg. Co. The unit is mounted on a firebox frame equipped with a pair of rubber-tired wheels.

Capable of operating a six-nozzle spraybar, the power spray attachment is powered by a Kohler K-90 engine. A V-belt drives the 1-inch Viking gear asphalt pump. The four-cycle engine uses gasoline for fuel and develops 3.6 horsepower at full throttle.

A bypass with an adjustable relief valve allows materials to bypass when the spraybar line valve is closed, thus eliminating the need for engine shut-down when spraying is interrupted. With the control valve open, a strong nozzle pressure is maintained to provide a steady flat-shaped spray for satisfactory surface penetration and for coating around and under small stones, according to the manufacturer.

For further information write to the Chausse Mfg. Co., Inc., 4453 14th St., Detroit 8, Mich., or use the Request Card at page 18. Circle No. 15.

### Concrete block machine

■ The Gene Olsen Corp.'s Trustee concrete-block machine will produce 1,100 8-inch blocks per hour, according to a bulletin from the company. Operating on a 35-hp motor, the unit produces three blocks at a time. Features of the machine described are the single-acting cylinders, pushbutton remote control, variable cycle, oil pump, vibrator motors, automatic height control, and machine and control adjustment.

To obtain the bulletin write to The Gene Olsen Corp., 442 Grace St., Adrian, Mich., or use the Request Card at page 18. Circle No. 156.

### Tape catalog

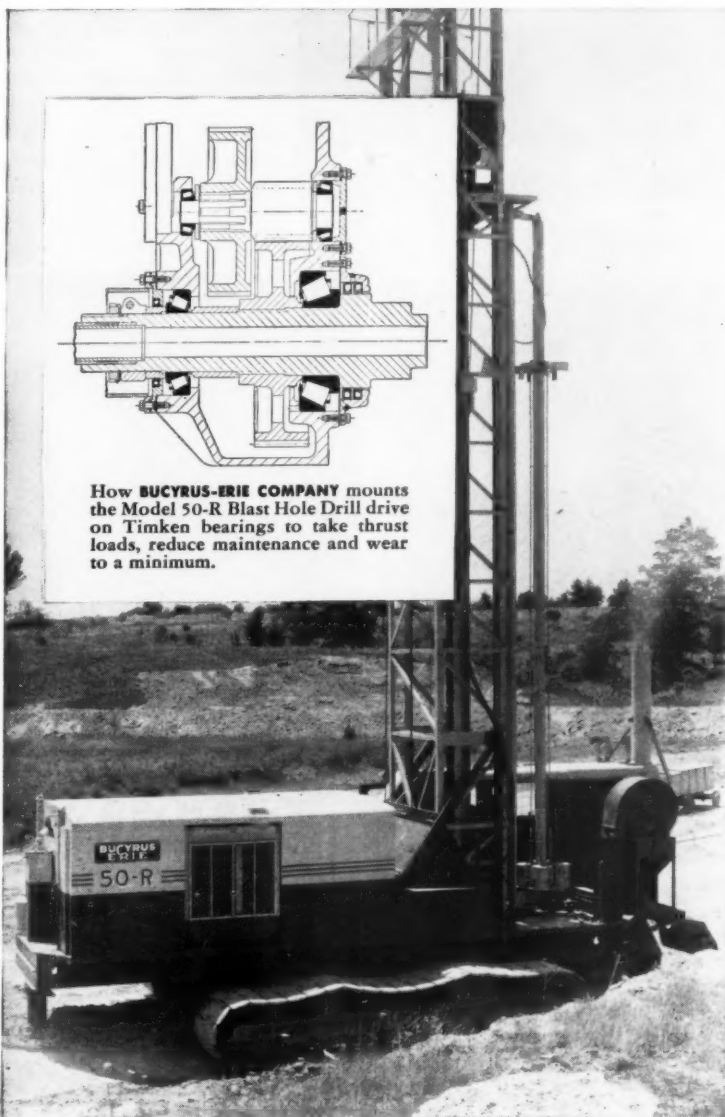
■ A complete line of measuring tapes manufactured by the Evans Rule Co. is listed in a catalog from the company. All tapes are marked so that it is possible for a contractor to measure any object in feet and inches or in inches alone. Items pictured in the catalog are pocket and king-size tapes, replacement blades, and folding rules. The tapes are available in lengths from 6 to 100 feet.

To obtain Catalog No. 56-1C write to the Evans Rule Co., 400-416 Trumbull St., Elizabeth, N. J., or use the Request Card that is bound in at page 18. Circle No. 158.



"They sent a pig through to clean this section of pipe."

## TIMKEN® bearings help massive rotary drill take big blast holes in stride



How BUCYRUS-ERIE COMPANY mounts the Model 50-R Blast Hole Drill drive on Timken bearings to take thrust loads, reduce maintenance and wear to a minimum.

DEVELOPED to meet demands for a big hole rotary blast hole drill, this Bucyrus-Erie 50-R can drill up to 12 1/4-inch holes with a speed never before possible. To take the terrific thrust loads on the drill bit (up to 30 tons) while drilling hardest quarry formations, and also to maintain accurate gear mesh, Bucyrus-Erie Company mounts the main and intermediate shafts of the rotary drive on Timken® tapered roller bearings.

Taking heavy thrust loads is routine for Timken bearings. That's because: 1) The tapered construction enables Timken bearings to take both radial and thrust loads in any combination, and 2) Full line contact between rollers and races gives Timken bearings extra load-carrying capacity.

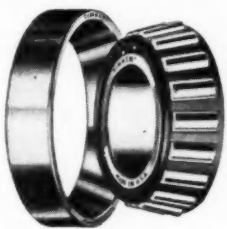
Results show up in many cost-saving ways. With Timken bearings shafts are held in rigid alignment. Gear mesh is smooth and accurate. Shaft wear is eliminated, gear wear reduced. Parts last longer and operate steadily at peak efficiency.

What's more, Timken bearing rollers and races are case-carburized to give them hard, wear-resistant surfaces over tough, shock-resistant cores.

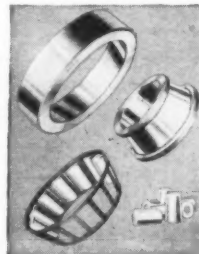
Only Timken bearings give you so many advantages. We even make our own fine alloy bearing steel. We're America's only bearing manufacturer that does. For the most long-lasting, money-saving performance, specify Timken bearings for the machines you buy or build. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



**TIMKEN**  
TRADE-MARK REG. U.S. PAT. OFF.  
**TAPERED ROLLER BEARINGS**



### DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roller ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ○ THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST ○ LOADS OR ANY COMBINATION

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One Caterpillar D9 tractor pulls a Euclid loader in a borrow pit. The big tractor handled the loader at a good rate of speed as Euclid bottom dumps were filled.

C&E Staff Photos



A Cat DW21 scraper pushed by an Allis-Chalmers HD-21 tractor picks up a load in a cut area as it passes another earthmoving rig.

## Many rigs speed grading of new Kansas Turnpike

**Design and construction of 236-mile superhighway to be done in 2 years, setting new road-building record**

The Kansas Turnpike opens to the public in three months, climaxing two years of the most rapid highway design and construction ever attempted. Yet the 236-mile project might not have been ready by this fall if it had not been for the thousands of men taking part in its design and construction, and the huge fleets of construction machines that made such rapid work possible. Even though the work is divided among nearly 70 contractors, and many of them operated more than one spread of equipment



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CONTRACTORS AND ENGINEERS



Practically all types and makes of equipment are used on the pike. The Ferguson 50-ton rubber-tire roller, above, pulled by a Cat D8 is being used on the section under contract to Clarkson Construction Co., Kansas City, Mo. At right, a McCoy sheepfoot pulled by a Cat D8 compacts a fill on the Amis-San-Ore joint-venture spread, while the fill is being shaped by graders. Density requirements were 100 per cent Proctor in the top 18 inches, 95 per cent in the next 14 inches, and at least 90 per cent in the remainder of the fill.

on more than one section of the job at a time, building a 236-mile turn-pike in two construction seasons is quite a feat. It is even more remarkable, considering that weather in the area usually limits outdoor construction to eight months of the year.

The road, with a right-of-way 300 feet wide except at interchanges, service areas, and the like, consists of two 24-foot pavements separated by a 20-foot median that is depressed 21 inches below pavement grade. Outside shoulders will be 10 feet wide

and surfaced; inside shoulders will be 4 feet wide.

This is a typical cross section of the pike, which has its northeasterly terminal at 18th and Muncie in Kansas City. From here, it runs westerly to Topeka, southeasterly to Wichita, and south to the Oklahoma line, passing near Lawrence, Topeka, Emporia, El Dorado, Wichita, and Wellington. Interchanges at principal state highways on the outskirts of these cities, and at several intermediate locations, will make it possi-

ble for motorists to drive swiftly from one city to another, or all the way to the Oklahoma line.

In building this road, contractors had to excavate 45 million cubic yards of material, 6.1 million yards of which was rock. A total of 541.6 miles of fence is needed on both sides of the right-of-way. A total of 253 bridges had to be constructed to carry the pike either over or under other highways, railroads, and waterways. These spans required more than 53 million pounds of structural steel. More than

1.5 million square yards of 10-inch concrete pavement, and more than 5 million square yards of heavy-duty bituminous surfacing and base will be needed to complete the roadway.

#### Make good progress

Despite the enormity of the job, progress was fast on the pike. Only two months after October 19, 1954, when 14 engineering firms were selected as section engineers to prepare detailed plans for the superhighway, bids were taken for the first of the



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The batch plant, used by Amis Construction Co., Oklahoma City, Okla., to supply concrete for drainage structures, was fed with aggregates by a Trojan Loadster. The hopper feeds the bucket elevator leading to the Winslow Binanbatch hopper, where batches were weighed out to truck mixers.

C&E Staff Photos

(Continued from preceding page)

construction contracts. Construction actually began December 31, 1954, with the ground-breaking ceremonies for the bridge over the Kansas River northeast of Lawrence. Just a week before this, the first contract for the substructures of the 2,316-foot dual bridge had been awarded to Massman Construction Co., Kansas City, Mo.

When winter weather put a stop to most construction late last November, practically the entire turnpike was under contract, much of the grading for drainage structures and bridges had been completed, concrete paving had begun, and the base was being laid for the bituminous pavement.

#### Mechanized grading

All this work was made possible by the speed with which grading was done. A substantial part of the 45 million cubic yards of excavation was moved in one construction season, even though some of the contracts were not awarded until July.

Grading was not unusually heavy or difficult: there were no extremely deep cuts or high fills; nor was there any substantial amount of unstable subgrade material. But there were enough variables in the grading conditions so that a number of types of equipment had to be used. Rubber-tire and tractor-drawn scrapers loaded and moved a large part of the earthwork. Elevating loaders and haul units worked well on some of the sections using relatively large borrow pits or having long areas of cut. Some of the earth and softer rock deposits were loaded by power shovels and carried away by haul units, while the hard rock deposits had to be drilled and blasted before the material could be loaded out by shovels.

The diversity of equipment used by one grading contractor on two sections that totaled 9 miles of the pike, east and south of Topeka, was typified by the Clarkson Construction Co., Kansas City, Mo.

In this hilly area there were more areas of woods than on many other sections of the turnpike, and clearing was an important operation. Clarkson used three Caterpillar D8 tractors and Allis-Chalmers HD-15 and HD-20 tractors—all equipped with dozers—to clear the trees and doze them into piles on the right-of-way for burning.

With this done, the main earthmoving spread moved in. The five Euclid scrapers and three Caterpillar DW21 scrapers forming the backbone of this spread were push-loaded in the cuts and borrow pits by Allis-Chalmers HD-19 and HD-21 push tractors. As the scrapers spread their loads in thin layers on the fills, the material was shaped by Caterpillar No. 12 and Allis-Chalmers AD-40 motor graders. Before and during compaction, the surface of the fills was thoroughly worked by a Rome single-unit disk pulled by a Caterpillar D8 tractor. Compaction was done by a Gebhard sheepsfoot roller and a Ferguson 50-ton rubber-tire compactor, both pulled by Caterpillar D8 tractors.



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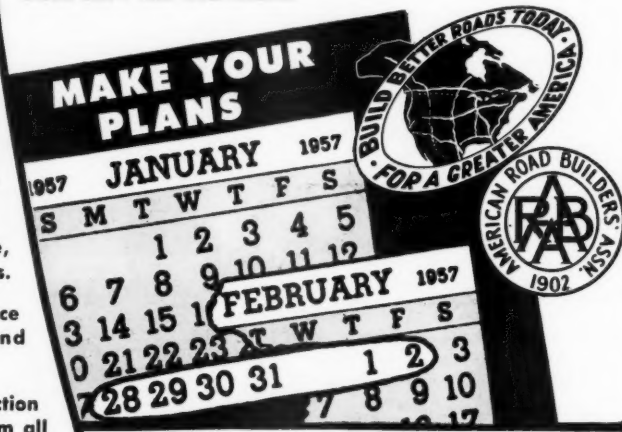
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### AMERICAN ROAD BUILDERS' ASSOCIATION

World Center Building Washington 6, D. C.

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As a section was brought to approximate grade, and the spread moved on to a new area, a finishing spread moved in for the final touches. In this spread were two Caterpillar D8 tractors pulling Bucyrus-Erie scrapers, two Caterpillar No. 12 motor graders, and an Allis-Chalmers HD-15 tractor-dozzer, together with supporting equipment for water control and compaction.

When digging got tough, this contractor used an Ateco ripper on the rear of one of the Cat D8 tractors or switched to still another spread of equipment. Handling both the hard and soft rock operations were two Northwest 80-D shovels with 3½-yard buckets. Three end-dump and three bottom-dump Euclids hauled from the shovels to the fills, where Caterpillar D8 tractor-dozers spread the material as compaction was applied by a Ferguson 50-ton unit. Where drilling and shooting were required, the contractor used two Joy drills mounted on Ford tractors. Air was supplied to the drills by a Chicago Pneumatic rotary 600 compressor.

These spreads, comprising only some of the equipment used by Clarkson on these sections, are enough to show the variety and number of machines required to grade a relatively small segment of the turnpike.

#### Work on scattered sections

Some contractors were the successful bidders on work in several scattered sections of the turnpike, and some took contracts for more than one type of work. Amis Construction Co., Oklahoma City, Okla., and San-Ore Construction Co., McPherson, Kans., for instance, not only held separate contracts, but also worked as a joint venture to grade two sections.

Amis took contracts for grading and drainage, base, and paving. The San-Ore work was paving, except on the joint-venture grading job. San-Ore placed the bituminous paving on sections 1 and 2 at the Oklahoma line, and on 18 and 19 near Emporia. Amis built the base for sections 9 and 10 east of Wichita, the bridges on section 144B near El Dorado, and graded section 22 near Admire. The joint-venture grading was on sections 20 and 21, between Emporia and Admire.

The two joint-venture grading sections, and the one graded by Amis, were adjacent and operated almost as a single job. Some of the men and equipment were shifted from one section to another, and the general supervision of the three sections was handled by a single project manager. The 3½ million cubic yards of earth and the ¼ million yards of rock moved in grading the 20-plus miles of expressway in these three sections was handled by a huge fleet of equipment.

Two of the spreads handling the most yardage were built around two Euclid loaders pulled by Caterpillar D9 tractors and the bottom-dump Euclids that did the hauling. Each of the powerful D9's handled one of the loaders. Each rig appeared to

(Continued on next page)

In areas where blasting is required, Ingersoll-Rand and Worthington drills, mounted on an International T-6 and supplied with air by a Gardner-Denver compressor, put down holes with Timken rock bits.



## How to beat a fleet of limited-duty rigs ... WITH ONE International Drott 4-IN-1



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Gain a 30-inch (or greater) dumping height advantage over ordinary roll-forward bucket dumping—by using the bottom-dump feature of the Four-In-One as a clamshell. And loading with the clamshell action, get a super-fast bucket-fill on stockpiled materials, even in cramped quarters.



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Get big dozing capacity with finger-tip ease with your Four-In-One in bulldozer position. Regulate dozing depth by hydraulic "radius control" of blade pitch. Note the frost-breaking, earth-moving action. Shown here is new 2¼-yard Four-In-One for the International TD-14.



Prove Four-In-One versatility unlimited with the 1-yard TD-6, the 1½-yard TD-9, or the new 2¼-yard TD-14 model. Test exclusive pry-over-shoe break-out action, and exclusive shock-swallowing Hydro-Spring. Ask your International Drott distributor for a Four-In-One demonstration.



International Harvester Company, Chicago 1, Illinois

# INTERNATIONAL® DROTT

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work at least as fast as a loader with the usual two smaller tractors, and both switched from one cut to another exceptionally fast. Where hauls were long, as many as 13 "Eucs" moved the material. On shorter hauls, 6 or 7 of the units were sufficient.

Supplementing these units on the joint-venture project were eight Euclid scrapers, four Caterpillar D8 tractors with Cat 80 scrapers, five Cat D8 and D7 tractors with dozers, two International TD-24 dozers, two Ferguson and Bros 50-ton compactors with LeTourneau C tractors, three Gebhard and McCoy sheepsfoot rollers, six Caterpillar No. 12 motor graders, and many pieces of smaller equipment, such as light plants, water wagons and compressors.

On section 22, Amis used three Le-



Compaction is made easier after this Cat D8 manipulates and aerates the surface of a fill with a Rome disk. The tractor has an Ateco ripper bar at the rear for use when rock or other hard material must be scarified.

C&E Staff Photo



**Wire Rope at Work**—When Hurricane Diane loosed one of the most destructive floods in history, scenes like this were common. The angry torrents swept parts of Pennsylvania, New Jersey, New York, and New England, taking a staggering toll of lives and property. Bridges like the one above, in western Connecticut, were playthings of the raging waters.

Prior to the disaster, this bridge spanned the Naugatuck River. To salvage what was left after the flood, the Foundation Company was summoned from New York, and its hard-working crews and equipment were soon on the job. An emergency shipment of Bethlehem wire rope, ordered by telephone, was rushed to the site of operations; hustled into service. It had the muscle for the tremendous lifts involved, and in no time at all, the work of moving the wreckage was underway.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:  
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Tourneau-Westinghouse B Tournapulls and a twin C pusher, two Allis-Chalmers 300 scrapers, and a big spread of supporting equipment in addition to the "Euc" loader spread. Other types of equipment were put to work when rock was encountered.

Shale was ripped with a Cat ripper and loaded by the scrapers. Hard limestone was drilled by Worthington and Ingersoll-Rand drills mounted on an International T-6 tractor and powered by a Gardner-Denver 500-cfm compressor. The rock shattered by blasting was loaded into Euclid end-dumps for the haul to the fills by shovel.

Bridge approach fills had to be completed by certain calendar dates, and meeting these deadlines was a cause of concern for the contractors. In one 4-mile reach of section 20 there were seven bridge locations. Here, the pike crosses the Neosho River, two creeks, a railroad, and a county road, while two other county roads will be carried over the expressway.

A large part of the embankment for these approaches was obtained when a change was made in the Neosho River channel. One of the D9 and "Euc" loader spreads made the first cuts to straighten the channel, carrying the excavation down to near water level. Then a dragline with a Hendrix 3½-yard bucket went on down to grade.

Although the bridges were all built by other contractors under separate contracts, there was a considerable volume of concrete included in the drainage structures for the three sections. To supply this concrete, Amis set up a batching plant at a central point and delivered the mix as needed in a fleet of six Challenge mixers carried on Ford, International, and White trucks.

The batch plant contained a Winslow Binabatch hopper and proportioning equipment mounted on a tower high enough to permit material to be discharged directly into the transit mixers. A bucket elevator fed aggregates to the hoppers, the boot of the elevator being fed from the stockpiles by a Trojan Loadster. Water, stored at the plant in a 5,000-gallon tank, was pumped to the supply tanks of the mixers. Sack cement was introduced by hand.

At the work sites, Koehring 304 and Lorain MC254 truck cranes bucketed the concrete from the transit-mixers to the forms. This combination provided a flexible concrete-placement team that could move to any point on the 20-mile stretch in a matter of minutes, yet make a sizable pour in a day.

The many types of work being done by crews scattered over 20 miles of road made fast communication important. A mobile radio system filled this need, a combination of Motorola and General Electric equipment providing base stations at the field office and shop, while ten mobile units were located in the vehicles of the supervisory personnel.

Other contractors on the turnpike used a roster of equipment that was

CONTRACTORS AND ENGINEERS

at least as impressive as those used by Clarkson, Amis, or San-Ore. There were, in fact, few of the relatively well known earthmoving machines not in use on this project, and many of the new and not so well known machines got an opportunity to show what they could do.

#### Paving being rushed

The fast grading work on the 236-mile turnpike made it possible for both concrete and bituminous paving to get under way early. The Kansas Turnpike Authority decided on the use of both portland-cement concrete and bituminous paving after a report from Howard, Needles, Tammen & Bergendoff, consulting engineer to the authority, stated that both types were equally adaptable to Kansas weather and soil conditions. The factor in deciding which type was to be used in various sections was the accessibility of materials along the route.

The 55-mile section from the north-easterly terminus of the road in Kansas City to the South Topeka interchange is being paved with portland-cement concrete. The 181 miles of road from the South Topeka interchange to the Oklahoma line is being surfaced with heavy-duty asphaltic concrete.

The concrete pavement consists of a 10-inch reinforced slab, laid on a 4-inch subbase and a 1-inch sand leveling course. The bituminous pavement is being built up of a 10-inch crushed-stone subbase, 8 inches of water-bound macadam, and a 4-inch bituminous leveling and wearing surface. The total thickness of the flexible pavement is 22 inches; the concrete pavement and base are 15 inches deep.

Though one contractor, Western Contracting Corp., Sioux City, Iowa, started paving on a section between Topeka and Lawrence on October 24, 1955, and several contractors were placing base for the bituminous pavement as the season ended, paving actually did not get fully under way until the start of the current season.

Animals, pedestrians, and unauthorized vehicles will be kept off the completed pike by fencing, which is usually erected as crews move onto the right of way. In rural areas, the pike is fenced with woven wire having single strands of barbed wire at the top and bottom. Chain-Link fencing is used in urban areas, and around interchanges and service areas.

Service areas, located about 45 miles apart, have restaurant concessions awarded on a contract basis to private operators. A percentage of gross receipts from these facilities will go to the Turnpike Authority. These areas, located between the two roadways, are accessible to motorists traveling in either direction. North and south-bound lanes diverge at these locations so that the enlarged median has room not only for service and restaurant facilities but also for parking facilities and acceleration and deceleration lanes.

The administrative functions of the turnpike will be handled from a modern administration building being

constructed at the East Wichita interchange. Supervision of the maintenance, policing, and toll-collection facilities will be handled from this headquarters.

The chief executive officer of the Kansas Turnpike Authority is Gale Moss, general manager. The chairman of the authority is Francis Jacobs. The general engineering consultant to the authority is Howard, Needles, Tammen & Bergendoff, with Joseph Sorkin in direct charge of the work.

On the grading work, Clarkson Construction Co. has K. P. Allen as general superintendent; Amis Construction Co. and the Amis-San-Ore combine has Phil Royer as project manager.

THE END

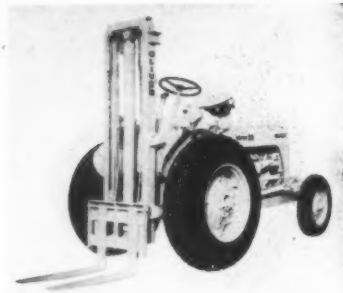
Remember—safety is no accident!

#### Power-steered fork-lift has six forward speeds

A new Super 55 fork-lift is announced by The Oliver Corp. The unit is designed to handle a wide variety of tasks around construction jobs, the manufacturer states.

With a lifting capacity of 4,000 pounds, models are offered with 8 or 10-foot tilting masts to accommodate various attachments, including standard forks in four lengths, a concrete block fork, a 1/2-yard hydraulic scoop bucket, and a dozer blade.

Six forward speeds provide a range of from 1 1/2 to 14 1/2 mph, in addition to high and low reverse speeds. The turning radius is 10 feet and the rig is equipped with hydraulic power steering.



The Oliver Super 55 is available with either 8 or 10-foot tilting masts.

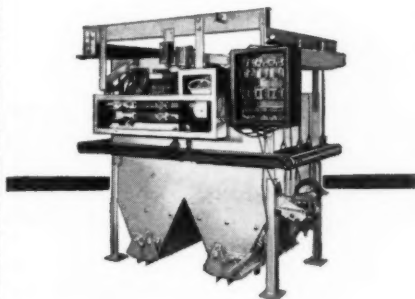
For further information write to The Oliver Corp., 400 W. Madison St., Chicago, Ill., or use the Request Card that is bound in at page 18. Circle No. 74.

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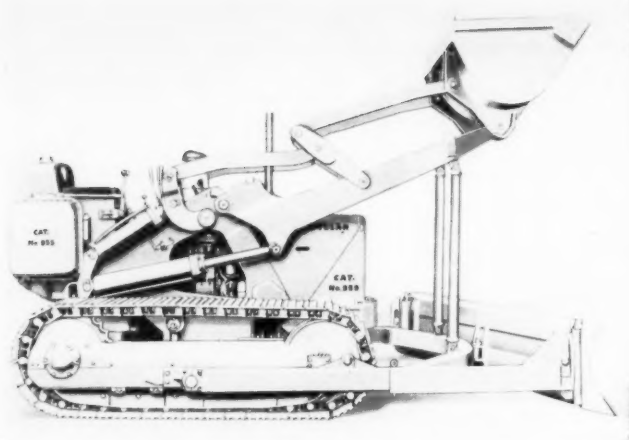
## BUTLER BIN COMPANY

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 275





Cat No. 955 Traxcavator with a No. 955A angling-blade bulldozer and a bucket spill-plate extension.

### Attachments announced for front-end loader

■ Three new angling-blade bulldozers and a bucket spill-plate extension, designed for use with the No. 977, No. 955, and No. 933 Traxcavators, have been announced by Caterpillar. The new bulldozers have been designated the No. 977A, No. 955A and No. 933A.

With the exception of the No. 933A C-frame group, the bulldozers consist of the same blade and C-frame groups as the No. 6A, No. 4A, and No. 2A bulldozers. Strong links are used to connect the bulldozer C-frame to the Traxcavator lift arms. The same hydraulic controls and cylinders are used for both bucket and blade.

The new bulldozers are said to provide greater versatility for Traxcava-

tors on such jobs as pioneering, road building, and backfilling. They are especially recommended for backfilling trenches after pipe has been laid and for replacing earth around new foundations.

The spill-plate extension makes it possible to get heaped loads without excessive spillage even when working in loose, friable material, the manufacturer states. Bolted onto the top edge of the bucket, it is adjustable and can be extended from 2½ to 5 inches above the bucket spill plate.

For further information write to Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 110.

### Tar-rubber joint sealer usable in all climates

■ Recommended for filling expansion joints in concrete runways designed for jet aircraft is SCCO hot-poured joint sealer, a tar-rubber compound made by the Studebaker Chemical Co. The compound is prepared by adding Goodyear Chemigum latex to tar with specially-developed plasticizers and catalysts.

According to the manufacturer, SCCO is resistant to oils, greases, gasolines, and jet fuels. Joints filled with the compound are said to be impervious to moisture infiltration even after repeated cycles of expansion and contraction.

Because of the homogeneity of the sealer, the company points out, joints can be maintained with a high degree of solvent resistance and adhesiveness in tropical climates as well as in subzero zones.

For further information write to the Studebaker Chemical Co., Elyria, Ohio, or use the Request Card at page 18. Circle No. 109.

### Manual power tools

■ Two models in the Multiple Corp. line of manually-operated power tools are presented in a folder. According to the specification table, the Model S-100 single-reel unit has a maximum reel capacity of 100 feet of ¼-inch-thick cable. The self-contained Model T-100 unit has a maximum reel capacity of 50 feet of ¼-inch-thick cable.

To obtain the folder write to Multiple Corp., 1908 N. Main St., Dayton 5, Ohio, or use the Request Card at page 18. Circle No. 64.

### New organization handles rotary drilling machines

A new firm, Rotary Drilling Equipment, Inc., with offices at 221 W. Olive St., Scranton, Pa., has been formed to serve the eastern states with rotary drilling machines and equipment for the drilling of blast holes. The firm is handling both Davey and Williams equipment.

In addition to its promotional work, the company is also manufacturing drill rods, stabilizers, and bit adaptors.

CONTRACTORS AND ENGINEERS



**500' PER 9 HR. DAY IN TENNESSEE LIMESTONE:** For the rock portion of the 351,000 cu. yd. excavation for Capitol Hill Redevelopment project at Memphis, Tenn., J. B. Michael Construction Co. powered their two wagon

drills with a Jaeger rotary "600" compressor. "We start it and never worry about plenty of air for the two wagon drills, averaging 500' per 8-hour day, without lugging or overheating", says job superintendent David B. Phillips.

## Jaeger 600 Rotary . . . your most efficient power for wagon drills

A Jaeger "600" rotary compressor produces the same 600 cfm of air as other "600" compressors, using the same 6-71 GM diesel engine at 100 to 150 rpm slower speed (1650 rpm instead of 1750 or 1800).

On long hours of steady drilling this slow, cool, efficient operation means substantial fuel savings, fewer fpm of

engine piston travel, up to 9000 fewer compressor revolutions every hour you work.

Smaller Jaeger Roto Air Plus® units have this same characteristic of low speed, high efficiency performance. It will pay you to get full details or demonstration from your Jaeger distributor—or let us send you Catalog JCR-5.

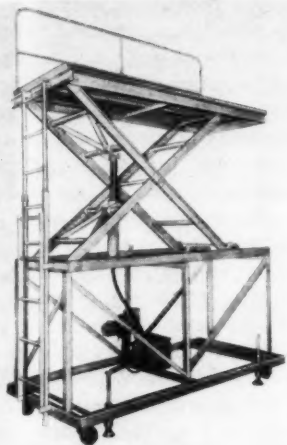


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The Ballymore hydraulic-lift work platform.

### Work platform raises by hydraulic action

■ A hydraulically operated work platform said to offer new standards of safety and convenience for production and maintenance work above ground level is manufactured by the Ballymore Co., Wayne, Pa. The platform is said to eliminate the need for scaffolds.

In its lowest position, the Ballymore platform is 5 feet above floor level. Hydraulic power raises it to any height up to 10 feet. Power can be supplied in any of three ways: by ¼-hp electric motor; by self-contained, battery-operated motor; or by hand pump. A double rack and pawl arrangement holds the platform at working height. Access to the platform is by a telescoping ladder located at one end.

Constructed of steel, the work platform is mounted on four swivel 8-inch-diameter ball-bearing casters for easy portability. A screw-type leveling jack at each corner assures complete stability on either level or uneven floors. The platform is 33 inches x 7 feet 8 inches, and provides room for three men to work comfortably. Rated load is 1,250 pounds.

For further information write to the Ballymore Co., Wayne, Pa., or use the Request Card at page 18. Circle No. 42.

### Air-powered tools

■ Signode air-powered tools for tying forms in concrete construction and in more efficient handling of materials are covered in a catalog from Signode Steel Strapping Co. Job photos and case histories point out the many uses of the tools.

To obtain Form 3547 write to Signode Steel Strapping Co., 2630 N. Western Ave., Chicago 47, Ill., or use the Request Card at page 18. Circle No. 60.

### Barnes to expand plant

The Barnes Mfg. Co., producer of pumps and water systems, plans a \$500,000 expansion of its plant in Mansfield, Ohio. The firm will completely revise its manufacturing machines and processes, under the direction of Worden & Risberg, Philadelphia, Pa., management consultant.

### Two new crane carriers with unique cab design

■ The Federal Motor Truck Co., a division of Napco Industries, Inc., is marketing two new 6x6 crane carriers, an 8 and a 10-ton model.

According to the manufacturer, the special cab design of the new Federal carriers provides extra visibility. The frame rails are heavy-duty 8x12-inch 45-pound wide-flange beams in the 8-ton units and 12x12-inch 65-pound wide-flange beams in the 10-ton carrier. This extra frame strength, together with a 10,000-pound front driving axle and a 28,000-pound rear bogie, is said to provide the ruggedness needed for the toughest crane, shovel, or backhoe assignment.

The new carriers are powered by

The new Federal crane carriers feature greater visibility because of their unusual cab design.



Chrysler 265-cubic-inch gasoline engines. Equipped with four-speed transmission and dual-range transfer cases, the carriers have eight forward and two reverse speeds. Tires are 7.50 x 20, 8-ply type.

Optional equipment includes front and rear outriggers, rear fenders,

power steering, heater and defroster, and 8.25 x 20 or 9.00 x 20, 10-ply tires.

For further information write to the Federal Motor Truck Co., a division of Napco Industries, Inc., 834 N. Seventh St., Minneapolis 11, Minn., or use the Request Card at page 18. Circle No. 67.



## Now! New Heavy-Duty V-8's!

With the most **GO** under any truck hood!

### V-8 power to cut your costs!

These new 206, 226, 257 hp. modern truck V-8's in the new INTERNATIONAL V-Line have "built-in" reserve power that gets your biggest loads moving *fast* . . . a lively response that keeps them rolling with shifting greatly reduced, even on the most rugged off-highway operations. You save operating costs and you save trip time.

In short, the new INTERNATIONAL V-Line is built to set new highs in your profit column!

### Tested and proved as no other trucks have ever been!

Developed and tested in the lab, then put through more than 1,000,000 test-track miles, and in 2,500,000 on-the-job miles in 39 different truck vocations.

These tests were made by profit-minded truckers with a gimlet-eye on mileage, hauling time and repair bills. Their conclusions—"GREAT, on every count!"

### 3 Great New INTERNATIONAL V-8 Engines!

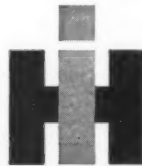
	V-401	V-461	V-549
Displacement	400.9 Cu. In.	461 Cu. In.	548.7 Cu. In.
Bore and Stroke	4 1/8 x 3 3/4	4 1/8 x 4-5/16	4 1/2 x 4-5/16
Maximum hp.	206 @ 3600	226 @ 3600	257 @ 3400
Maximum Torque	355 @ 1800-2000	420 @ 1600	505 @ 2000

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## Avoid legal pitfalls

### Subcontractor's rights on mutual cancellation

**THE PROBLEM:** A subcontract on a construction job was cancelled by mutual agreement after partial performance. Was the subcontractor entitled to be paid the reasonable value of labor and materials furnished, as distinguished from payment computed on a contract basis?

**THE ANSWER:** Yes. (*United States v. Traylor Bros., Inc.*, 133 Fed. Supp. 104, decided by the United States Dis-

trict Court, Northern District of Indiana, South Bend Division.)

### Excavator held liable for injury at unguarded pit

**THE PROBLEM:** A contractor dug a trench 15 feet long, 4 feet wide, and from 1 to 4 feet deep in a busy street. It was guarded principally by a frail wooden horse, about 3 feet high, at one end of the ditch. Due to poor lighting, the horse was dislodged and thrown into the street by a motorist. Another motorist was injured when his car drove into the ditch. Was the contractor liable in damages?

**THE ANSWER:** Yes. (*Walsh v. City of Pittsburgh*, 108 Atl. 2d 769, decided by the Pennsylvania Supreme Court.)

Judge Musmanno, who wrote the

court's opinion said that whoever digs a pit in the middle of a busy street and fails to properly barricade it should be held responsible in money damages to those who are injured through his imprudence.

### Liability for damages from negligent blasting

**THE PROBLEM:** Was a contractor, blasting for a sewer tunnel, liable for damages to nearby houses? Excessive charges of dynamite had been used, and the blasting continued after a warning that damage was resulting.

**THE ANSWER:** Yes. (*Albison v. Robbins & White, Inc.*, 116 Atl. 2d 608, decided by the Maine Supreme Judicial Court.)

At the trial, the court said that

evidence tending to show that the contractor's superintendent had said, while the work was being carried on, that the contractor was protected by liability insurance had been properly excluded, as it did not show that the blasting had been done negligently.

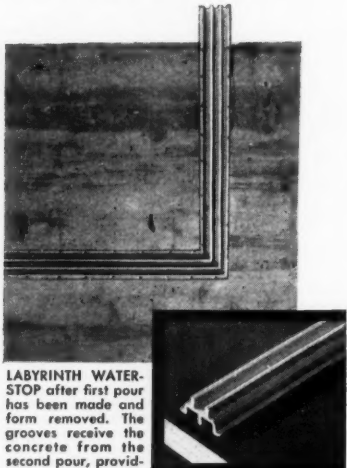
But the court argued that construction history in Maine shows that rock and ledge can be blasted with only rare instances of damage to adjacent property if the user of explosives "has the knowledge he should have and when proper care is exercised". Maine grandfathers did efficient and careful work with black powder. That dynamite is quicker and less expensive is no excuse for negligence.

### Shipment-delivery place

**THE PROBLEM:** When construction materials or other goods are sold for shipment from the place where the seller does business to the place where the buyer is located, and the shipment is damaged, destroyed, or deteriorates in transit, question may arise as to whether the shipment was "delivered" to the buyer when loaded by the seller. The seller is in the clear if the shipment is considered complete upon loading. If the contract were such that delivery was not complete until arrival of the shipment at its destination, the seller risks loss or damage in transit. A recent case illustrates the point. A Texas contractor bought material from a Portland, Oreg., lumber company for use in Texas and to be shipped there by rail, F. O. B. the seller's plant. The material met contract specifications when loaded, but was allegedly deficient on arrival. Was the delivery complete in Portland so as to defeat the contractor's claim for damages against the lumber company?

**THE ANSWER:** Yes. (*E. E. Cloer General Contractor, Inc., v. Timber Structures, Inc.*, 270 S. W. 2d 693, decided

## Waterstop in place in seconds!



Just a few seconds were needed to nail this LABYRINTH WATERSTOP to the form...just a few seconds and water seepage worries were over before they could ever have a chance to start. LABYRINTH WATERSTOP forms a waterproof bond between two pours. The corrugated ribs bond firmly with the concrete.

LABYRINTH WATERSTOPS are made of flexible polyvinyl plastic... that has superior weathering qualities, is not affected by temperature changes and chemical activity.

LABYRINTH WATERSTOPS are easy to work with, can be cut to any desired length. "L" and "T" joints can be welded with just a hot knife. Find out now how your costs can be cut...and end your seepage problems. Just mail the coupon to:

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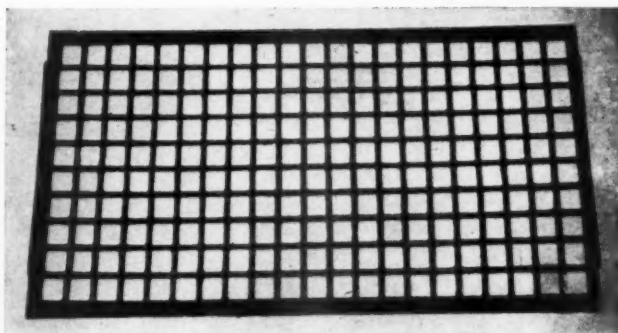
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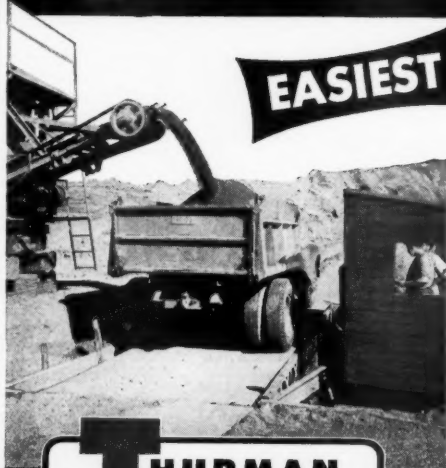
These blocks are being successfully used on flat slabs, lift slabs, tube slabs, pan slabs and bridges. The use of concrete blocks eliminates the rust spots on ceilings generally left when bolster chairs are used.

With proper care and oiling after use, these molds will last for years. Sold in sets of three which will take care of beams and slabs from 2" to 10". Immediate delivery. Call or write

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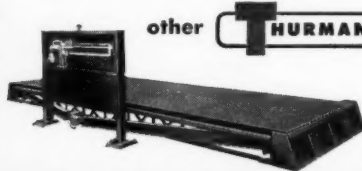
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by the Texas Court of Civil Appeals, Fort Worth.)

The decision followed generally recognized rules of law to the effect that, in the absence of agreement or controlling custom to the contrary, goods shipped to a buyer are at his risk after they are put in transit. In this case, the specification F. O. B. seller's plant, in legal effect meant that the materials were at the contractor's risk after being loaded at the seller's plant.

### Settlement of date for receiving interest

**THE PROBLEM:** A contractor agreed to furnish labor and materials for a job but there was no agreement on price; thereby making the owner liable for the reasonable value of the work. A lawsuit was necessary to decide a reasonable price. Was the contractor entitled to interest on the amount decided by the court, from the date when the work was completed and accepted?

**THE ANSWER:** No. Interest ran from the date of the judgment. (Hopkins v. Ulvestad, 282 Pac. 2d 806, decided by the Washington Supreme Court.)

In line with what most courts recognize to be law, the court decided that interest usually does not accrue on an obligation until the precise amount of the obligation is determined. An exception to the rule exists when the debtor unreasonably delays a determination of the reasonable value of services that have been rendered.

### U. S. loses defense under strike clause

**THE PROBLEM:** A federal dam-construction company required the government to deliver cement at the site, but provided that "the government will not be liable for any expense or delay caused the contractor by de-

layed deliveries except as provided in Article 9", which extended time for completion in case of strike. The contractor was delayed when a railroad strike held up delivery of cement. The government forsook that a strike would delay delivery but took no steps to speed it up. Was the government liable to the contractor for added expense incurred as a result of the delayed delivery?

**THE ANSWER:** Yes. (Ozark Dam Construction Co. v. United States, 127 Fed. Supp. 187, decided by the United States Court of Claims.)

The court said, in effect, that it would be harmful to the public interest to relieve the government from its own negligence, because bidders might be inclined to increase their bids by an amount large enough to guard

against loss under such an immunity-from-liability clause as was involved in this case.

### Contractor is protected against suit for damages

**THE PROBLEM:** A subcontractor's employee was injured on a building job when he backed a truckload of cement up a ramp. He was awarded \$5,000 in workmen's compensation against the subcontractor. Under Kansas law, could the employee, the subcontractor, or the subcontractor's insurer then sue the general contractor for damages on the theory that the accident had been caused by his negligence?

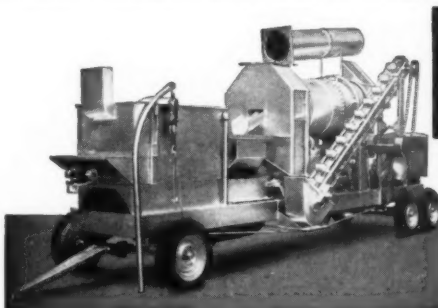
**THE ANSWER:** No. (Whitaker v. Douglas, 292 Pac. 2d 688, decided by

### Edited by A. L. H. STREET Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

the Kansas Supreme Court.)

The court stated that the Kansas workmen's compensation law was so worded that an award of compensation against the subcontractor was all that the injured worker had a right to claim. From a legal standpoint, the subcontractor's furnishing cement for the contractor involved



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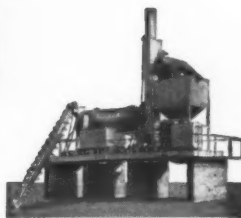
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## avoid legal pitfalls

the general contractor's trade or business. The same would have held true if the injured man had been directly employed by the contractor.

### Lien law does not apply to land-leveling work

**THE PROBLEM:** A Utah statute requires a landowner to secure a bond from a contractor for payment of materials used in performing a contract involving more than \$500 and the "construction, addition to, or alteration or repair of any building, structure, or improvement upon land". Did the statute require a bond

covering a land-leveling contract?

**THE ANSWER:** No. (*Backus v. Hooten*, 295 Pac. 703, decided by the Utah Supreme Court.)

The court said that land leveling could not be regarded as an improvement "upon" the land. But the decision does not seem to make the statute inapplicable if leveling is an incidental part of the job under a prime contract or a subcontract.

### Truck-registration fee covers tax on mixer

**THE PROBLEM:** A concrete mixer is permanently mounted on a truck. Under Iowa statutes governing the registration and taxation of motor vehicles, can the mixer be regarded as a permanent part of the truck, upon

which a registration fee is paid, and therefore be free from separate taxation as personal property?

**THE ANSWER:** Yes. (*Crown Concrete Co. v. Conkling*, 75 N. W. 2d 351, decided by the Iowa Supreme Court.)

The court said that the equipment did not fall within statute provisions for "special mobile equipment", as had been decided by a lower court. Moreover, the Supreme Court said, such an interpretation would redound to the advantage of truck owners, not the state, because the registration fees paid by the concrete company for five years would have been twice the amount of personal-property tax assessable against the trucks, including the mixers.

### Checks to joint payees must be endorsed by all

**THE PROBLEM:** A contractor jointly awarded a subcontract to a low bidder and a steel company. On completion of the work, the contractor issued checks in full, payable to them jointly. The bank paid the bidder on his endorsement and an unauthorized endorsement of the steel company. Was the bank liable to the contractor for his resulting loss?

**THE ANSWER:** Yes. (*Fulton National Bank, Atlanta, v. Didschneit*, 88 S. E. 2d 853, decided by the Georgia Court of Appeals.)

The decision rests upon the rule of law that a negotiable instrument payable to two or more persons jointly must be endorsed by all of them unless it is payable to them as partners.

### License is revoked for application misstatement

**THE PROBLEM:** A member of a corporation that had been issued a contractor's license had been convicted and sentenced for issuing checks against insufficient funds. Under California law, was the license revokable on the grounds that the corporation had stated in its application for license that none of its members had ever been convicted of a felony?

**THE ANSWER:** Yes. (*Nelson Valley Building Co. v. Morrissey*, 288 Pac. 2d 135, decided by the California District Court of Appeals, Third District.)

### Contractor must pay minimum road-work wage

**THE PROBLEM:** Employees of a contractor worked as bulldozer and scraper operators during the construction season and in the contractor's garage during the winter. They were paid a flat weekly wage of \$50 for the entire employment period. Under Kentucky statutes fixing minimum (prevailing) wages to be paid by public-road contractors, were these employees entitled to be paid an additional sum for the time spent on road work? The additional sum would be measured by the difference between the flat rate and the prevailing wages paid for operation of bulldozers and scrapers.

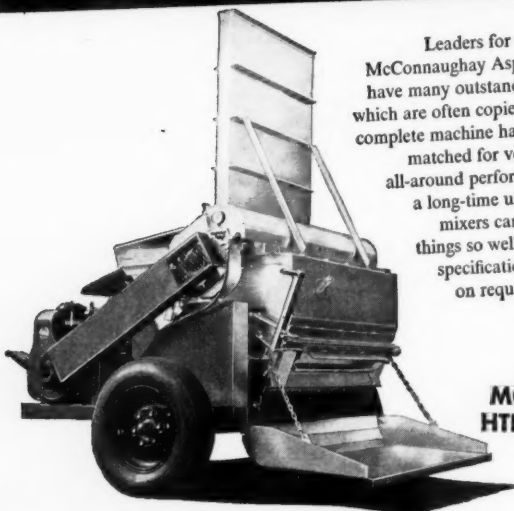
**THE ANSWER:** Yes. (*Lwellyn v. Harmon*, 285 S. W. 2d 150, decided by the Kentucky Court of Appeals.)

### Damages for delayed construction measured

**THE PROBLEM:** A housing development owner-contractor sued a subcontractor who delayed installation of sewers. There was no dispute as to the number of houses that could not be offered for sale because of the delay nor as to the contractor's mortgage indebtedness covering them. Could the owner-contractor collect mortgage interest as part of his damages, even if there was no direct proof that the homes could have been sold had the sewers been installed on time?

**THE ANSWER:** Yes. (*L. & S. Construction Co. v. Bradbury Homes, Inc.*, 118 Atl. 2d 681, decided by the Maryland Court of Appeals.)

## Often Copied but Never Matched

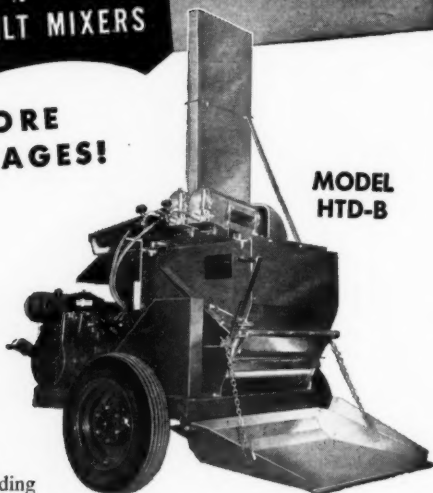


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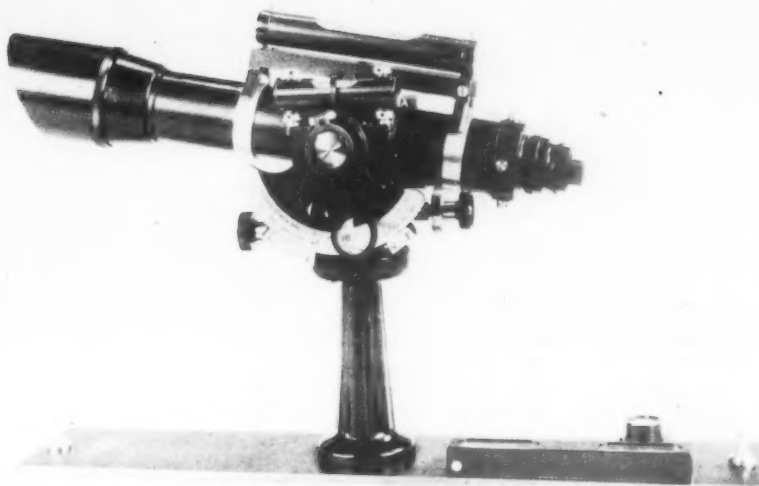
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Floor Specialists  
Over 21 Years of Continuous Service  
6958 South State Street, Dept. CE-76  
Chicago 21, Illinois

For more facts, circle No. 285

CONTRACTORS AND ENGINEERS

INTERNAL FOCUSING now is a feature of the Gurley Model 582-F alidade, an instrument recommended for use by surveyors and engineers in making maps by the plane table method. This standard alidade, mounted on a pedestal, also has a stationary objective lens to protect the telescope from dust. For details on the alidade write to **W. & L. E. Gurley**, 518 Fulton St., Troy, N. Y., or use the Request Card at page 18. Circle No. 125.



### Lead-lining techniques

■ Ramset lead-lining techniques for steel, concrete, and wood tanks are featured in a catalog from the company. The step-by-step process of lining heavy-wall steel tanks is shown and described. Data is given on lining thin-wall steel tanks, wood tanks, and concrete tanks. General installation and operator training are detailed.

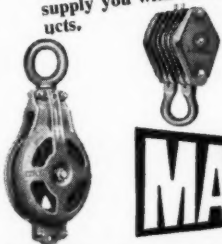
To obtain this catalog write to Ramset Fasteners, Inc., Division of Olin Mathieson Chemical Corp., 12117 Berea Road, Cleveland 11, Ohio, or use the Request Card at page 18. Circle No. 135.

### Baker-Raulang names new sales executive

The new manager of sales engineering for the Baker-Raulang Co., Cleveland, Ohio, is E. E. McVeigh. With the manufacturer of gas and electric material-handling trucks since 1940, McVeigh has done extensive sales work.

### FOR SAFE AND SPEEDY HOISTING

Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel and graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Sheaves equipped with bronze or anti-friction bearings for easy operation and long service. Our special service departments will help you with their recommendations. Write for our catalog or consult your equipment dealer who can supply you with MADESCO products.



**MADESCO TACKLE BLOCK CO.**  
EASTON, PA.

**BLOCKS**

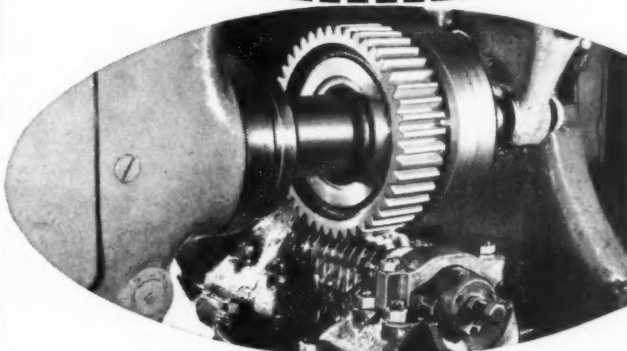
**Engineered to Serve  
Your Special Service Needs**

For more facts, circle No. 286

JULY, 1956

Important reasons why  
it pays to use

**True Original  
Parts**



1

#### PRECISION-MADE

Skilled craftsmen bring True Original Parts to life—working with the most modern manufacturing equipment and meeting the highest industrial standards. The result: precision-made parts get full work power from your Allis-Chalmers machinery.



2

#### CAREFULLY INSPECTED

True Original Parts go through rigid original-equipment inspection and testing processes to assure long-life service. For example, gears are checked again and again for perfect meshing... for true balance... for full capacity.



3

#### PROPERLY PACKAGED

You want your parts factory-new... and that's how you get True Original Parts. Many are specially treated... then sealed and packaged against rust, dust and damage.

A country-wide network of dealers stock ample supplies of True Original Parts. Whether you're working in one area or across the country, you can depend on reliable parts service close to your job from your Allis-Chalmers Construction Machinery dealer.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

**ALLIS-CHALMERS**



For more facts, use Reader-Reply Card opposite page 18 and circle No. 287





Two Caterpillar D8 tractors, one pulling and the other pushing, load a La-Plant Choate 33-yard scraper to capacity on one of the cuts. Approximately 1,000,000 yards of earth were removed in this way.

C&E Staff Photos

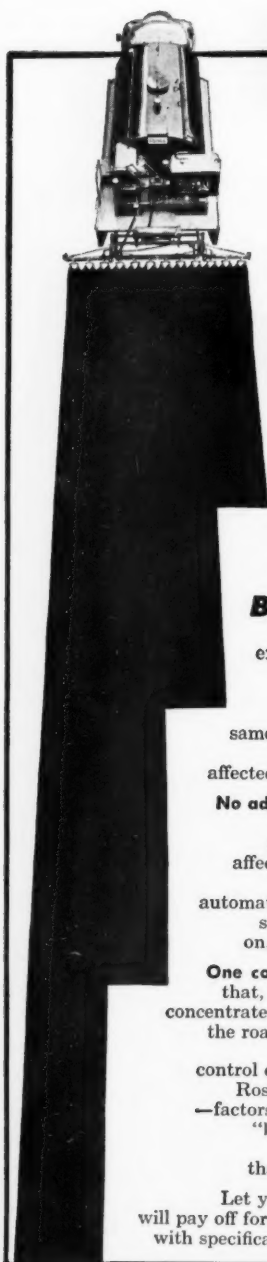
## New rotary drill rig speeds rock removal

A relatively new drill rig, sinking 6-inch holes at a rate of 1½-feet per minute through hard sand-rock, simplified the removal of 300,000 cubic yards of rock on a 6½-mile relocation of U. S. 422, near Worthington, Pa.

The rig, a truck-mounted Davey rotary drill, was brought onto the \$1,912,728 job by Ralph Myers Contracting Corp., Pitcairn, Pa., after a 6-inch earth auger had run into an unexpected substrata of rock. The Davey unit, using both compressed air and high-pressure water, drilled up to 300 feet of 6¼-inch holes with air and up to 1,000 feet with water.

It can also drill holes from 3⅝ to 12 inches. Powered by a Davey 480-cfm air compressor driven with a Ford engine, the drill is mounted on a GMC 6×6 truck.

Once on the job, the Davey unit started sinking 6-inch holes on 10-foot centers. The bit used during drilling was placed at the end of a 15-foot section of drill rod which was cable-suspended by the 28-foot drill tower until it was needed. As the hole deepened, sometimes going down to 25 feet, a new drill rod was screwed onto another rod and fastened to the kelly bar at the top. Holes were loaded for



## ROSCO'S PRESSURE METERING

### MAKES THE DIFFERENCE AT ANY WIDTH!

#### Do you know...

that it's possible to apply bitumen through any length of spraybar from 1 to 24 feet without changing the pressure and without any application adjustment? It can be done with a Rosco! You would normally expect surges or drops in pressure to occur when sections of a distributor's spraybar are shut-off or turned on.

#### But...

NOT with a Rosco Distributor equipped with exclusive Pressure Metering. Even when as much as 23 feet of a 24-foot spraybar are shut-off, the precise, accurate delivery remains unaffected... the pressure in the working one foot stays the same as it was pre-set at the beginning of the run. The accurate delivery from the working nozzles is not affected... no matter how many feet of the bar are cut out.

No adjustments in truck or pump speed are required—in fact, with Pressure Metering the pump speed never changes and normal wear of the pump never affects the accuracy of the application. When any part of the spraybar is shut off, the excess material is automatically by-passed. Pressure at the operating nozzles stays the same. When additional nozzles are turned on, pressure is immediately available to supply them.

One control sets the pressure specified for the job. After that, pressure control is automatic... the operator can concentrate full attention to spotting the material properly on the road. Pressure Metering is an integral part of Rosco's patented Master Valve that permits one-lever control of all normal distributor functions. You'll find that Rosco's Pressure Metering is faster and more accurate—factors which can be the difference between a "make" or "break" job in today's highly competitive field. And Rosco's Pressure Metering assures you of jobs that will always meet rigid application specifications.

Let your Rosco dealer show you how Pressure Metering will pay off for you. Or write the factory for descriptive literature with specifications on Pressure Metering-equipped Distributors.



ROSCO BITUMINOUS DISTRIBUTOR with Pressure Metering. Front or rear mounted for truck or trailer.

**ROSCO**  
MINNEAPOLIS

3118 SNELLING AVENUE • MINNEAPOLIS 6, MINNESOTA  
DISTRIBUTORS • MAINTAINERS • BROOMS  
SUPPLY TANKS • TAR KETTLES • STREET FLUSHERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 290

## ROCKFORD

*This is the Clutch that the nations largest manufacturers of heavy-duty machines are showing as a NEW feature*



TRADE MARK

### New MORLIFE\* CLUTCHES and CLUTCH PLATES Give—

**MORE Clutch Life (400% MORE)**  
**MORE Torque Capacity (100% MORE)**  
**MORE Heat Resistance (50% MORE)**

These new ROCKFORD Clutches and Clutch Plates have been developed by ROCKFORD Clutch Engineers to take full advantage of recently discovered facing material. Actual field tests on heavy duty equipment have resulted in adoption of MORLIFE clutches by builders of tractors, earth movers, graders, shovels, cranes, trucks, oil field equipment and power units. For information how these new Rockford MORLIFE Clutches will improve the operation and increase on-the-job hours of heavy duty machines, write Department E.

**ROCKFORD Clutch Division BORG-WARNER**  
314 Catherine Street, Rockford, Illinois, U.S.A.

## CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 291

CONTRACTORS AND ENGINEERS



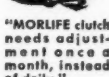
"MORLIFE clutch has gone 851 hours without slipping or adjustment."



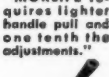
"MORLIFE clutch going strong after 1695 hours, working in sand."



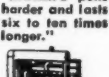
"MORLIFE clutches last 950 hours longer, without adjustment."



"MORLIFE clutch needs adjustment once a month, instead of daily."



"MORLIFE requires lighter handle pull and one tenth the adjustments."



"MORLIFE pulls harder and lasts six to ten times longer."



"Won't buy a unit that isn't equipped with Durable MORLIFE clutch."

blasting with approximately 50 pounds of Atlas or Du Pont dynamite for a 20-foot hole.

The air-compressor not only powered the drill, but also supplied a large quantity of air to blow the hole clean during drilling. A dust catcher, consisting of a metal cylinder with a 6-inch horizontal outlet pipe, rested on the ground directly over the drill

hole being sunk, forcing the dust to be blown away from the drill rig. Since the drill rods were positioned on top of the metal cylinder, dust could escape only through the horizontal outlet pipe.

#### Rock and earth removed

Two Bucyrus-Erie 54-B shovels  
(Continued on next page)



A dust catcher, consisting of a cylindrical shell placed over the hole being drilled, blows dust from the Davey rig. A 6-inch horizontal outlet pipe controls the release of dust.



The Davey rotary drill sinks a 6-inch hole in hard sand-rock. Mounted on a GMC truck, the unit uses 15-foot-long drill rods which are cable-suspended from a 28-foot drill tower.

## News about CONCRETE FINISHING



Here is a really smooth finishing job done on a super market floor with the STOW G-34 Roto-Trowel. Note that the operator was able to trowel right up to the walls, because of the rugged, stationary guard ring. According to men in the field, the new STOW trowel is the most advanced, best engineered trowel on the market; and it makes possible extremely smooth surfaces.

The STOW G-34 Roto-Trowel handles easily. It has many important safety features, such as the fool-proof, dead-man clutch control that stops blade rotation the instant the operator releases the handle. The engine remains running, thus eliminating the necessity of re-starting the engine. For complete information about the complete line of STOW Roto-Trowels, write today!



46" Roto-Trowel

34" Roto-Trowel

New 24" Roto-Trowel

#### SPECIFICATIONS

Model No.	Trowel Diameter	Ring Diameter	Engine	Trowel Speed	Float Trowels	Finish Trowels	Operating Weight
G-24	24"	25"	Briggs & Stratton 2.2 HP	35 to 130 RPM	6" x 10"		69 lbs.
G-34	34"	35"	Briggs & Stratton 2.5 HP	25 to 100 RPM	10 x 14"	6 x 14"	145 lbs.
E-34	34"	35"	G.E. Fan-Cooled 1 1/2 HP	90 RPM	10 x 14"	6 x 14"	139 lbs.
G-46	46"	48.5"	Wisconsin - BKN 6.8 HP	25 to 100 RPM	10 x 18"	6 x 18"	212 lbs.

# STOW

STOW MANUFACTURING CO.

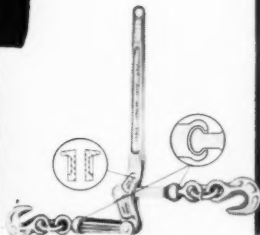
40 Shear Street, Binghamton, N. Y.

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when the goings rough  
and the load is tough...

the answer is  
**LEBUS  
LOAD  
BINDERS**

Completely drop-forged  
and heat treated  
for added strength  
and safety.



LEBUS ROTARY  
TOOL WORKS, inc.



P. O. BOX 2352  
LONGVIEW, TEXAS

LeBus Tail  
Chains



LeBus Truckers  
Snatch Block

OPEN CLOSED

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## WYCO "Junior" VIBRATOR

### LIGHTWEIGHT ONE-MAN OPERATION!

#### Smallest Vibrator Head Made!

1 1/4 inches in Diameter  
with high frequency and high kick  
**ABLE TO HANDLE STIFF MIX-  
LOW SLUMP CONCRETE!**

Will do 90% of the contractor's  
work better and — at lower cost!

900 J-5 WYCO Vibrator overall  
length 6' — Vibrator 1 1/4" diameter  
— Total weight 20 lbs.

Flexible shaft extension up to 15' long



**\$135.00**

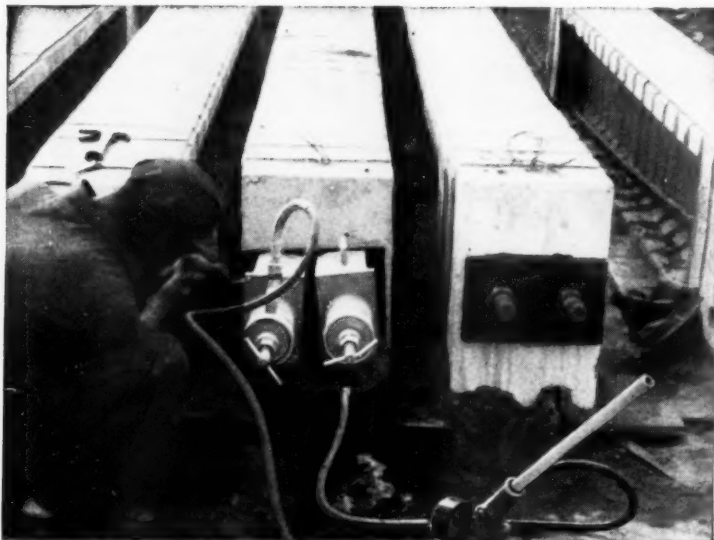
f.o.b. Chicago

Send for free bulletin

**WYZENBEEK & STAFF, INC.**

223 No. California Ave., Chicago 12, Ill.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 294



Post-tensioning girders with Simplex equipment. Note single pump operating dual "Re-Mo-Trol" units.

## Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations

Construction Men Acclaim Ease and Safety of Simplex Methods

Pre-tensioning and post-tensioning concrete becomes a quick, easy task with Simplex hydraulic equipment. Because of the "center-hole" pulling feature of Simplex units, wires, rods and cables can be tensioned without torque, "off center" pressures or complicated back-up devices. Eliminating these factors accounts for a 75% increase in ease and efficiency.

Simplex "Re-Mo-Trol" units consist of a "center-hole" hydraulic pulling ram connected by high pressure hose to a hand, air, electric or gasoline operated hydraulic pump. This powerful combination permits uniform stressing with maximum operator safety and speed. Once the ram is in place, the pump can be actuated safely from any nearby, convenient location.

"Re-Mo-Trol" hydraulic pullers are ideally suited to prestressing operations at the job site and for use in permanent pre-tensioning beds. These versatile Simplex units are available

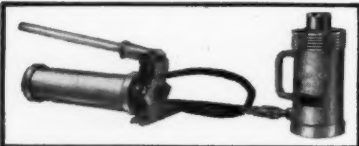
in standard capacities from 10 to 100 tons, and can be used for heavy tonnage high-pressure tensioning of cables, rods or wires or for pushing or pulling against a holding bracket in multiple bed stressing operations.

The standard Simplex units provide a range of capacities sufficient for most applications. However, custom-built units are available up to 600 ton capacity.

Another Simplex hydraulic puller, the "Jenny", is a self-contained unit which serves as its own back-up or can be used with a simple chair to reduce set-up time.

Either device can be used not only as a puller but as a hydraulic jack or press for moving heavy equipment and the like.

For detailed data on the selection and application of Simplex Pullers for prestressing concrete and other construction jobs, write for your copy of our new bulletin: "Hydraulic 56".



**SIMPLEX "RE-MO-TROL"**—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure.

**SIMPLEX "JENNY"** is a hydraulically operated center-hole puller which also serves as a press or heavy duty jack. It is a self-contained unit available in capacities from 30 to 100 tons.



**TEMPLETON, KENLY & CO.**

2511 Gardner Road • Broadview, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 295

(Continued from preceding page)

with 2 1/2-yard buckets followed the Davey rig closely to remove blasted rock. Six Euclid 20-ton end-dumps hauled this rock to fill areas where it was spread in 2-foot lifts by Caterpillar D8 dozers.

The moving of approximately 1,000,000 cubic yards of earth from large cuts was handled by a fleet of six Caterpillar No. 21 scrapers pulled by Caterpillar DW21 prime movers, and four La Plant Choate 33-yard scrapers pulled by Caterpillar D8 tractors. Four D8's equipped with front-end push blocks push-loaded the scraper to capacity, and ten D8's shaped the earth fill, which had been placed in 8-inch layers.

Fills and cuts balanced, with the maximum cut being 45 feet and the maximum fill, 40 feet. As the earth fill was placed, it was compacted by four Buffalo-Springfield 10-ton three-wheel rollers, and two extra-heavy

Gebhard sheepfoot rollers pulled by Caterpillar D8 tractors.

#### Base work

Held to a minimum 80-foot width, the right-of-way has two 22-foot roadways separated by a 4-foot white reflectorized curb and two 8-foot stabilized shoulders. Asphalt, at a ratio of two to three gallons per square yard, will be applied by a pressure distributor on a 9-inch crushed-aggregate base, and a 2 1/2-inch-thick wearing surface of concrete will be laid in one lift for an 11-foot width to complete the roadway. A 200-foot-long reinforced-concrete culvert is one of the largest drainage structures on the road.

All structure work was handled under a subcontract and was completed last season. The entire job is scheduled for completion this month.

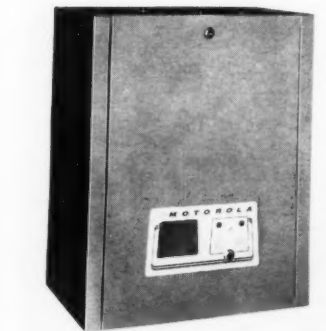
Representing Ralph Myers Contracting Corp. at the site is M. Hoke, superintendent. **THE END**

## Two-way radio adaptable to remote-control setup

■ A new addition to Motorola's standard line of fixed FM two-way radio equipment operating in the 25 to 54 or 144 to 174-megacycle band is the Compa-Station transmitter-receiver. The unit includes a 60-watt transmitter and the Motorola Sensicon G receiver.

The Compa-Station's removable control panel with built-in speaker can be placed in any of three positions on the cabinet for versatility of installation. The transmitter-receiver is easily adapted to two or four-wire remote-control operation from a remote-control console.

The 22 x 13 1/2 x 29-inch cabinet provides proper ventilation for base station operation. The unit operates from any standard 117-volt, 60-cycle power source, and weighs approximately 100 pounds.



For further information write to Motorola Communications & Electronics, Inc., Motorola, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 16.

## Need HOSE in a HURRY?

**Suction • Water • Steam  
Air • Multi-Purpose  
Discharge • Pile Driver**

Wherever your job is—whenever you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—when and where you want it.

There's no need to wait for distant shipments—no need to stop the job—no need to lose profits.

Any time you need hose call Continental. You'll like the fast service and dependable quality you get from these warehouses:

ATLANTA 5, Ga.  
477 Eighth St., N.E.

BALTIMORE 18, Md.  
15 East 21st St.

BOSTON (Ails. 34), Mass.  
12 Franklin St.

CHICAGO 10, Ill.  
10 West Hubbard St.

CINCINNATI 2, Ohio  
49 Central Ave.

CLEVELAND 15, Ohio  
2731 Prospect Ave.

DETROIT 27, Mich.  
13801 Schoolcraft Ave.

INDIANAPOLIS 4, Ind.  
309 North Capitol Ave.

MEMPHIS 3, Tenn.  
268 Madison Ave.

NEW YORK 7, N. Y.  
81 Murray St.

PHILADELPHIA 6, Pa.  
311 North Randolph St.

ST. LOUIS 8, Mo.  
4018 Olive St.

SYRACUSE 3, N. Y.  
739 Montgomery St.



Continental Suction Hose is recognized nationally by contractors for its superior quality—not an ordinary hose, but a hose built for rugged, dependable service. Sizes 1 1/2" through 12", for water and/or sand suction. Send for catalog of HOSE and PROTECTIVE CLOTHING.

**HOSE by CONTINENTAL**

CONTINENTAL RUBBER WORKS • 1989 LIBERTY ST. • ERIE 6 • PENNSYLVANIA

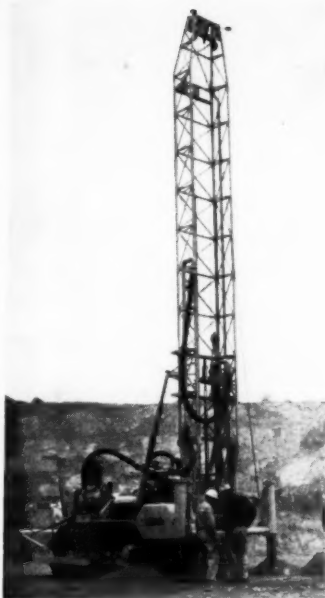
For more facts, use Reader-Reply Card opposite page 18 and circle No. 296

CONTRACTORS AND ENGINEERS

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The Portadrill Model 6TA rotary drill.

### One or two men operate tractor-mounted drill

■ A new heavy-duty rotary drill for cutting vertical blast holes in construction operations has been announced by The Winter-Weiss Co. Known as the Model 6TA, this addition to the Portadrill line mounts on a Caterpillar D6.

The drill utilizes compressed air for cuttings removal. Two rotary compressors, operating singly or together, provide a maximum air pressure of 85 psi. Normal drilling pressure is 15 psi.

Power for the drill is obtained from the tractor engine through a heavy-duty transfer case. All controls are located at the rear of the drill. Usually, two men operate the rig, although one man can complete shallow holes alone, the manufacturer states.

For further information write to The Winter-Weiss Co., 2201 Blake St., Denver 5, Colo., or use the Request Card at page 18. Circle No. 107.



### BIG GUILLOTINE THE NEW WACHS POWER PIPE SAW

No Flame—Safe Cuts Under  
Hazardous Conditions!

**FASTER—SAFER—ACCURATE!**

Cuts 10", 12", 14" & 16"  
Cast Iron and Steel Pipe

#### WACHS BIG GUILLOTINE SAW FACTS—

- Cuts Fast
- Cuts Clean
- Cuts Square
- Set up time, several minutes
- Power—electric or air motor
- Weight 312 pounds
- Height 31"
- Width 31½"
- Depth 14½"

Power Pipe Cutters from 2 inch to 6 Foot Capacity

For further information write to:

**THE E. H. WACHS COMPANY**  
1925 N. Dayton Street • Chicago 22, Illinois

For more facts, circle No. 297

The new Gen-A-Matic diaphragm pump.

### New diaphragm pump built for heavy duty

■ The Gen-A-Matic Corp. has introduced a new diaphragm pump designed specifically to handle water laden with mud, sludge, sewage, pebbles, and other foreign bodies that clog the action of ordinary centrifugal pumps.

Reportedly designed from suction to discharge for hard, rough pumping conditions, the new Gen-A-Matic pump is said to have a high operating efficiency for suction lifts up to 25



feet. Capacity is 6,000 gph.

Special features of the new unit include the long-life diaphragm, non-clogging valves, and the use of anti-friction bearings in the pump rod and in the main transmission. Transmission is enclosed for long, rugged service life and a minimum of maintenance. The pump is powered by a one-cylinder, 4-cycle air-cooled gasoline engine with high tension magneto and impulse coupling, oil-bath air cleaner, fuel tank, and hand crank.

For further information write to Gen-A-Matic Corp., 14741 Bessemer St., Van Nuys, Calif., or use the Request Card at page 18. Circle No. 21.

## On the St. Lawrence Seaway...and the World Over Bucyrus-Eries' Prove that Good Equipment DOES Make a Difference



One of two Bucyrus-Erie 150-B 6-yd. shovels responsible for much of the 2.7 million cubic yards of excavation for the Iroquois control dam. This \$14-million structure will maintain the levels of Lake Ontario.

On the St. Lawrence Power and Seaway projects some extremely tough digging conditions have been encountered—glacial till with the density of concrete, sticky blue marine clay, and heavy boulders. In the thick of this rough going Bucyrus-Erie Ward Leonard electric shovels are handling big yardages, week after week, month after month—proving that good equipment *does* make a difference.

The extra margin of quality that makes these machines standouts on tough jobs gives you better performance in any digging. Their smooth-acting Ward Leonard electric control provides extra fast acceleration and deceleration to speed work cycles. Superior front-end design furnishes plenty of strength while reducing deadweight. And heavy-duty construction holds down maintenance costs as it lengthens machine life.

Bucyrus-Erie Ward Leonard electric shovels can make a difference on your jobs, too. We will be glad to provide complete information.

75156C

## BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN



For more facts, use Reader-Reply Card opposite page 18 and circle No. 298



Earthwork and highway surveying problems  
are solved fast and efficiently with . . .

## New electronic computers

by FRANK KYPREOS, research director

High-speed electronic digital computers are turning their "brain power" to problems of highway and heavy construction, and the results are striking. They are solving earthwork computations in a fraction of the time usually required, and time and costs are being cut even more with new methods that have been developed to

take advantage of the computers' special abilities.

Faster and cheaper computing is beginning to have far-reaching effects in many phases of engineering. In the design of roads, the electronic computers are making it possible for engineers to explore a larger number of alternative routes in greater detail

than it is economically feasible with conventional calculating methods. This same flexibility is extended to work with bridges and other engineering structures.

The machines are equally swift and accurate in getting answers for many non-engineering problems that highway departments, engineers, and contractors meet daily—problems in cost accounting, equipment control, inventory control, payroll accounting, cost reports and financial statistics, gas-tax distribution, and highway traffic studies.

There are at least 84 different models of domestically made electronic digital computers, and the handful used to date on highway work—which has been largely concerned with earthwork computation—provide some basis for judging them as practical investments.

### Univac 120

The highway engineering departments of both Louisiana and Arizona are already using the Remington Rand Univac 120 to determine highway grades and alignment, and borrow-pit capacities. These calculations are used to prepare preliminary estimates for bidding. (See "A Highway Department Saves by Spending", C&E, July, 1956, pg. 14.)

The Univac 120 is a punched-card electronic computer that performs complete calculations in fractions of a second while processing 150 punched



## "25 Years of Sales and Trouble-Free Service of Barnes Pumps —They've Got to be Good!"

L. K. RICHARDS, RICHARDS EQUIPMENT COMPANY,  
WACO, TEXAS, CONTRACTORS SUPPLIES AND EQUIPMENT.

**AFTER 25 YEARS OF SALES AND  
TROUBLE-FREE SERVICE OF BARNES PUMPS,  
WE KNOW THEY ARE THE BEST!**

Our business is built on good equipment and good customers. Barnes Manufacturing has played no small part in our growth and progress in the past 25 years.

We are proud of our Barnes Distributorship. We feel they build the best pumps in the construction industry.

*L. K. Richards*

**HOW LONG IS 25 YEARS?** Mr. Richards will tell you 25 years is long enough to span two generations in the contracting game. And, when son, like father comes back time after time for Barnes Pumps, these pumps must be good! And they are good! Large or small, each is engineered to give you the greatest value for your pumping dollar—in economy of operation—in uninterrupted service—and lowest year-to-year cost!

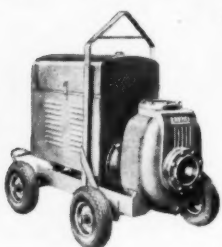
The pump shown below is a Barnes gasoline driven 90M standard 6-in. self-priming centrifugal, delivering more than 90,000 GPH—with the economy of delivering 33,000 gallons of water for each gallon of gas burned. You will find a size, choice of drive, and choice of power in Barnes Pumps to fit your exact requirements.

**BUY THE BEST . . . BUY BARNES SELF-PRIMING CENTRIFUGAL PUMPS**

3,000 to 90,000 GPH—GASOLINE, DIESEL, ELECTRIC OR PULLEY DRIVES

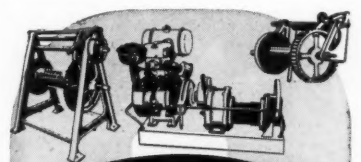
**BARNES MANUFACTURING CO.**

Mansfield, Ohio • Oakland 21, Calif.



*forward action in '56*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 299



**Saseg**

**Derricks  
Hoists  
Winches**

Over 50 years serving  
contractors . . . easily  
rigged on the job . . .  
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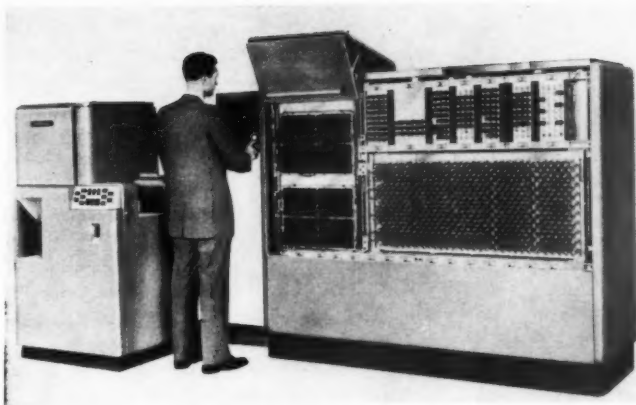
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**DERRICK COMPANY**  
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For more facts, circle No. 300  
CONTRACTORS AND ENGINEERS

Already in use by a few highway departments for earth-work and engineering problems is Remington Rand's Univac 120. ▶



A new and faster road-survey method, combining electronic computing and photogrammetry, uses the Bendix-G-15. ▶

cards a minute. Powered by electronic circuits that operate at the speed of light, the unit makes it possible for engineers, already in critical supply, to do more important work. It provides engineers with accurate results at sharply reduced costs, thanks to internal self-checking circuits.

The initial cost of the equipment is in the \$75,000 to \$100,000 bracket, depending on the capacity of the machine desired. Rental rates vary from \$700 to \$1,300 per month.

The Arizona State Highway Department, one of the first to turn to the use of a Univac 120, keeps the machine steadily at work to solve earth-work problems.

The first step in this process is to code cards with level-book data on the point of intersecting grades, the starting and ending stations of vertical curves, the maximum vertical curve corrections, grade rates, and alignment and curve-widening data.

Punched cards bearing this information are next prepared on an automatic key-punch machine. An operator punches the first station card with the project number, grade elevation at the starting point, rate of grade, and vertical curve length and maximum correction. These values are then automatically punched into all station cards that follow, leaving only the station number and the center line ground elevation to be punched manually into each card.

(Continued on next page)

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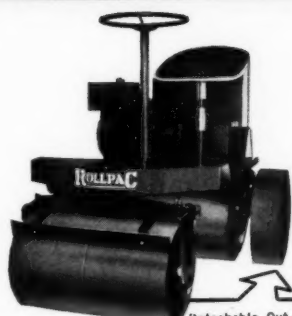
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 302

JULY, 1956



(Continued from preceding page)

Station cards at the point of intersecting grades, and the beginning of vertical curves, and cards containing equation station changes, require a code to instruct the computer to take the necessary steps in calculation.

Univac is told how to process the data by means of a detailed "program". The most important element in the operation of the computer, the "program" design, must gain maximum machine efficiency in the minimum number of steps. The complete "program"—which includes mathematical constants and computing instructions—is set and wired on a removable panel. When the computer is in use for other applications, the panel, with the program intact, is stored for future use.

A second panel of the computer, the input and output panel, is designed to connect individual card columns and card-column positions for input, output, and reproducing purposes. This panel may also be removed without disturbing the programmed connections.

After a "program" has been completely wired, it can be checked step-by-step with a dialing system on a test panel, from which values can be read directly.

The grade cards are now fed into the "programmed" Univac. Retaining the mathematical constants in its "memory" for repeated use, Univac 120 computes and checks one mile of grade cards in about a minute and a half. A second pass of the grade cards is then made for the computation of alignment and curve widening. At this time, the rate of slope on the high side and low side, and the amount of widening needed, if any, is punched into cards that require this information.

Univac computes, in a continuous operation, the tangent grade, vertical curve corrections, corrected grade through the vertical curve, and the amount of cut or fill at center line. The grades are computed through station and level equation. The final results are automatically tabulated on sheets for a permanent record.

The equipment automatically checks each arithmetical step of every calculation before proceeding to the next step. If a card is out of order, or the arithmetical step fails to check, the computer will either stop or segregate the desired card for correction.

#### Bendix G-15

Another computer, the compact Bendix G-15, combines the time-saving advantages of both electronic computing and photogrammetry for a new and speedier method of making road surveys. Developed by the engineering firm of Lockwood, Kessler, & Bartlett, Syosset, N. Y., with the Computer Division of Bendix Aviation Corporation, Los Angeles, Calif., the method involves seven steps:

1. A photomosaic of the route band is produced from high-altitude photographs.

2. Pairs of overlapping photos from the mosaic are studied under a stere-



The Wild A-5 stereoplotter, which carries control point data from one aerial photo to another reducing ground surveying to a minimum, is used in conjunction with the Bendix G-15.

oscope. In this way an expert can determine not only the nature of the terrain but also subsurface conditions.

3. A surveying crew obtains elevations and positions, by instruments, of check points chosen by inspection of the photo pairs. The required field-survey work is comparatively brief. At this point the electronic computer provides traverse coordinates and adjusts the survey data.

4. A topographic map one mile wide is made from the aerial photos. Pairs of these photos are placed in the Wild A-5 stereoplotter, which carries con-

Try seconds-fast crawler starting. Famous International gasoline conversion, *in-seat* starting is *standard equipment* in all International diesel models! You get fast, positive, all-weather diesel starting, without *fooling* or *fouling*!

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Try new International crawler steering. Unrivaled TD-24 Planet Power steering with capacity-boosting power on both tracks is responsive to even a school-boy's finger-tip touch! New hydraulic booster steering, in the new TD-18 and TD-14, reduces steering lever pull a big 75%. And the new T-6, TD-6, and TD-9 with spring-type steering clutch boosters are 25% easier to steer!

Above all, load up a new International crawler with matched International equipment—prove how bonus-powered performance boosts profit-production, wins operator preference, simplifies servicing. Choose from 7 heavy-duty crawler models, 41.5 drawbar to 200 net engine hp. Have your nearby International Distributor show you the bonus-powered performance package you need! Get a demonstration on your job today!

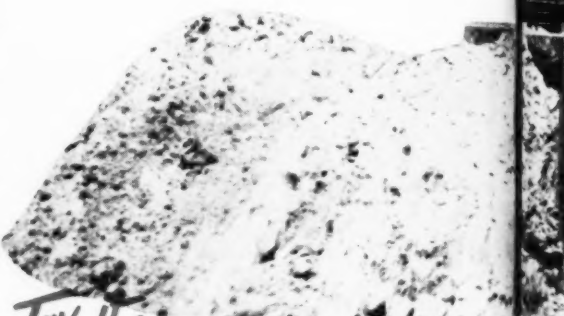
*Try it..*

a new **Dirt-Heaping, Bid-Beating International Payscraper®**! Even where four-wheel prime mover units bogged down and slowed this Rio Grande Floodway Project to a standstill, two new, easy-loading, high-clearance 75 Payscrapers—push-loaded by a TD-24 Torque Converter crawler—were able to complete a critical job on schedule. Compare a payload-boosting new Payscraper to any other two- or four-wheel unit in any operating condition.



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**bonus-powered crawlers...match dozers.** This new 103 hp TD-18 (182 Series) is helping build streets in a Saginaw Michigan subdivision—dozing sand and International hydraulic dozer. Operator rides in adjustable "club-car" comfort—has "control tower" job-bossing vision and a clean, safe deck with ample "stretch-out" room.



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a **brawny new rock-rugged International Payhauler®**... for fast off-highway hauling. Haul rock or aggregate, ballast, or ore, off-highway operate at speeds up to 38 mph—try a new 18-ton Model 6 or 24-ton Model 95, International Payhauler. Turbo-charged diesel-powered with highest hp-to-ton capacity ratio on the market! Strongest main frame sections known. See and try an International Payhauler!



control-point data from known points on the terrain to intervening points. The Bendix computer furnishes adjusted coordinates of the control points established by this "bridging".

This operation, the Lockwood, Kessler & Bartlett firm believes, has gone a long way to overcome the relative lack of precision inherent in taking elevation points from large aerial topographic maps. The Wild A-5 used is a first-order instrument, and the "spot elevations" it supplies for locations between control points are reported to be five times as precise as elevations interpolated from aerial

maps.

This greater accuracy is expected to convince contractors of the reliability of the photogrammetric method not only for estimating earthwork quantities for bid purposes but also for determining actual pay quantities.

The calculating time saved by using the Bendix G-15 in route survey work is impressive. In a recent test, the photogrammetric method was used to find the total cut and fill requirements of 230 cross sections of a proposed new 3-mile strip for the Long Island Expressway. It took about five hours to prepare the data

Earthwork computations can be done in about one-tenth the usual time with the IBM #604, a machine that can be used by sub-professional personnel.



and place it on a punched tape feeding into the G-15. The actual computation for the 230 cross sections took only 45 minutes.

By way of comparison, drawing cross sections and road profiles, working with a planimeter and manually going through other steps involved in this work takes an estimated 320 hours, or an hour for each cross section.

Reported current prices of the computer and optional accessories are: G-15 general purpose computer, \$44,800; digital differential analyzer attachment, \$13,700; magnetic tape data feed unit, \$6,800; graph plotter, \$1,800; and graph plotter-follower, \$5,700.

These prices include installation, three service calls, training courses for two qualified personnel in the operation and maintenance of the computer, warranty, some spare parts, and a tester.

#### IBM Type 604

The International Business Machines Corp. has developed a completely mechanized procedure for computing the volume of earthwork involved in the cut and fill of a road. This is a trapezoidal technique that utilizes the IBM 604 electronic calculator, which does the computing in 11 working hours per mile of road. The manual calculation of total cut, total fill, and net cut or fill at each station along the road center line takes 96 man hours per mile of road.

The cost of performing the calculations on a 604 that is kept working for the sake of economy is about one-tenth that of manual calculation, according to IBM.

Perhaps equally important is the fact that all the work with the punched cards can be done by non-technical personnel familiar with punched-card accounting systems. The saving in man-hours, then, represents sub-professional engineering time.

Savings will be even greater when the method is adapted shortly to the IBM 650 electronic data-processing machine. This is a magnetic-drum computer with a large data-storage capacity that enables it to do in one pass what the 604 does in many passes. The 650 will be able to compute cut and fill calculations in minutes instead of hours.

#### The Datatron

The Electrodata Corp., Pasadena, Calif., has an electronic data processor. For more facts, circle No. 303

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## Construction Equipment

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A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks



essing machine, the Datatron, which so far has not done heavy-construction computations, although it has been used to design refineries and fractionation towers for the oil industry. It is, however, capable of doing engineering work, including the solving of triangulation problems, and contour surveying where trigonometric functions and integral calculus are involved. It sells for about \$200,000.

Like other electronic computers, the Datatron is ideally adapted to work with accounting and record-keeping problems of large construction firms. The computer can prepare complete payrolls, inventories, cost reports, and the like automatically and at a high rate of speed. It has also proved useful for such secondary jobs as vehicle fleet cost analysis.

#### Burroughs E101

The lowest priced of all the general-purpose electronic digital computers is the Burroughs Corp. E101, designed to solve problems too complex to be handled efficiently by smaller calculators, yet not so complex that they can economically be solved by means of the giant machines.

The E101 is designed so that it can be stopped while the operator selects the next step in the 9-stage problem to be tackled. This makes it feasible to run trial-and-error problems, and it allows engineers and other trained specialists to use their experience and judgment in solving a problem. While the computer is stopped, data or instructions can be altered in a matter of seconds.

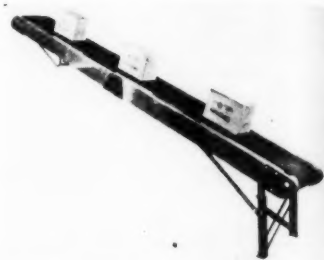
The six different components of the machine—a tabulating page printer, keyboard, electronic arithmetic unit, operator controls, pinboard program, and a magnetic memory—are combined in a single compact unit.

All these electronic computers have demonstrated that they can save time and conserve engineering talent by solving a number of design problems, but it is too early to predict the extent to which they will be used for other work or how widely they will be used by the construction industry. Interest in the possible uses of the computers is high, however, and the U. S. Bureau of Public Roads, in cooperation with the manufacturers, is continuing to study new uses that might be made of the machines.

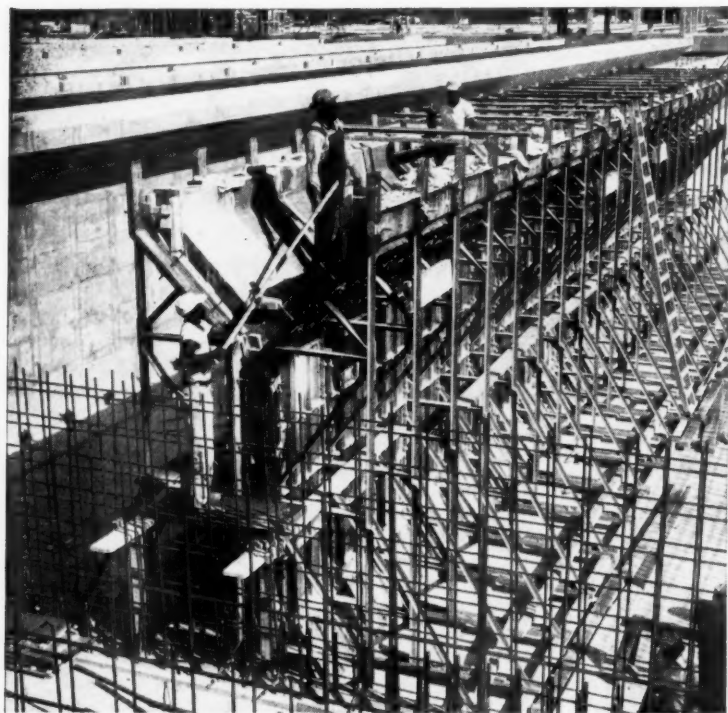
THE END

#### Lightweight conveyor has variety of uses

■ A lightweight, highly-maneuverable belt conveyor with a total distributed-load capacity of 250 pounds is being marketed by The Colson Corp. This light, rugged conveyor is of alu-



The Colson belt conveyor is recommended for loading and unloading materials hauled by truck or rail.



Special Y wall forming system makes for simplified stripping operation. 100% reusability of all materials. Note complete absence of lumber normally required for shoring and bracing on this type of structure.

## CUTS MATERIAL COSTS with Pre-Fab Form System on Sewage Plant Job

In the construction of the Miami Sewage Treatment Plant Job the Paul Smith Construction Co., of Miami, Florida chose to use the Uni-Form Panel System in the forming of one million sq. ft. of contact area. The contractor estimated that the use of the Uni-Form System saved 40 percent in material costs alone. In addition, faster form erection with fewer men kept the job moving ahead of schedule and reduced estimated labor costs considerably. These fine results were obtained even though this was the contractor's first experience with the Uni-Form Panel System.

This considerable savings in material and labor was realized in spite of intricate Y wall forming and pipe intersections which causes complicated forming problems with conventional forming systems.

Pre-fabricated, ready to use—completely engineered to handle most forming problems, the Uni-Form Panel System provides such advantages as simple assembly—minimum one side alignment and bracing—automatically accurate wall widths—positive internal spreading—faster stripping and maximum re-usage to give the contractor lowest all around form costs.

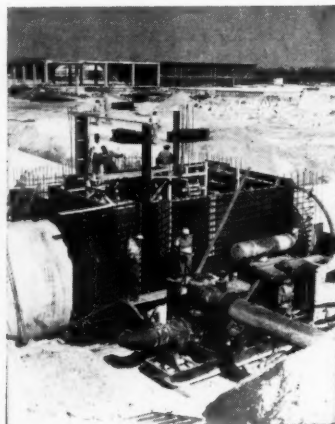
Y wall trusses designed to member with

standard Uni-Form Panels formed a completely automatic system for handling the special forming problems, and were big factors in the economy and speed obtained on the job. Simple assembly of Standard Uni-Form Panels on the trusses eliminated many of the aligning, bracing and spreading problems usually encountered in Y wall construction. In addition to simplified forming the combination system of standard Uni-Form Panels and trusses eliminated many of the problems normally encountered in the stripping of a wall section of this type. The contractor was well pleased with all phases of his forming and stripping operations.

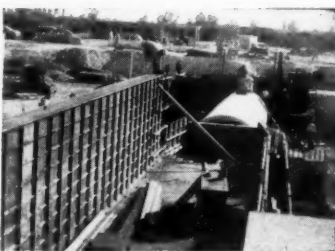
Why not investigate the many advantages the Uni-Form Panel System can bring to you? Write for the Uni-Form Catalog—or better yet, send us a set of plans for an estimate on your next job. Let us prove to you as we did to the Paul Smith Construction Co., that the Uni-Form Panel System can cut your forming costs.

**UNIVERSAL FORM CLAMP CO.**  
1238 N. Kostner Avenue • Chicago 51, Illinois

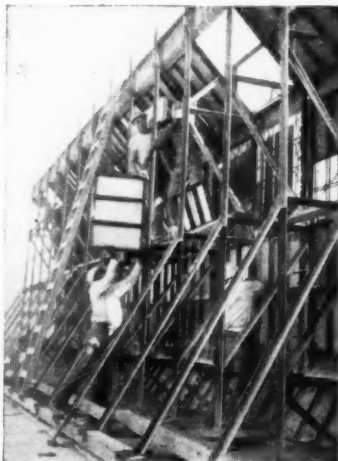
**Branch Offices and Warehouses:**  
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Cleveland, Ohio • Baltimore, Md. • Atlanta, Ga.



Intricate forming in restricted areas presented no problem. Uni-Form Panels erected aligned and braced one side eliminated difficulties normally encountered in placement of reinforcing steel. Note Uni-Form Panels around large precast pipe.



One side aligning and bracing provides clear unobstructed working areas increasing job efficiency.



Y wall trusses incorporated alignment, bracing, shoring and scaffolding requirements.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 304

minum-truss construction, and is available 16 inches wide in lengths ranging from 6 to 20 feet. Weight ranges from 145 to 225 pounds.

Because of its weight, this unit is said to be ideal for a variety of uses, such as a booster on a gravity conveyor line, for stacking, and for loading and unloading trucks and railroad cars.

Units up to 12 feet in length are powered by a 1/3-hp motor and units from 14 feet to 20 feet in length are powered by a 1/2-hp motor. In both cases, the power units are 110/220-volt, 60-cycle, single-phase motors. The belt is driven at the rate of 65 fpm.

The conveyor also is available in a heavier model which is 18 inches wide with a 12-inch belt, and can handle fully distributed loads up to 300 pounds. The larger model ranges up to 285 pounds in weight and 21 feet in length.

For further information write to The Colson Corp., Elyria, Ohio, or use the Request Card at page 18. Circle No. 152.

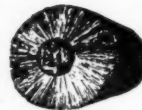
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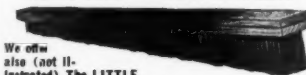
Suggestion! Buy Cores without any filling or we can furnish filled with steel spring wires—Bass—Palm or Hickory Fibres.

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Steel (or Fibre) road drag levelers Made in any c-o-n-t-i-n-u-o-u-s length up to 12 feet. 6 inches wide—kiln dried hardwood

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For more facts, circle No. 305

CONTRACTORS AND ENGINEERS



An equalizer that provides full track oscillation aids in maneuvering the Hyster D4 hydraulic backhoe for the Cat D4 tractor.

### Mechanism on new backhoe allows 240-degree swing

■ A new tractor-mounted backhoe, capable of digging to a 13-foot depth and loading to a height of 9½ feet, has been announced by the Hyster Co. Designed for the Caterpillar D4 tractor, the D4 hydraulic backhoe has a ½-yard capacity.

A rack-and-gear swing mechanism on the new rig, operating in an oil-tight case, provides swing power at uniform speed through a full 240-degree arc. An equalizer that allows full-track oscillation aids in maneuvering on rough terrain. The equalizer may be locked when rigid-tractor stability is desired.

Dippers for the backhoe are available in cutting widths of 13, 21, or 29 inches. They are equipped with Esco replaceable alloy-steel points, crimped onto adapters from the bottom to make replacement simple.

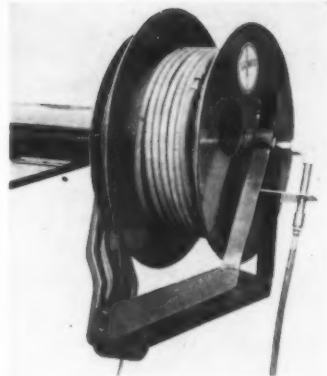
For further information write to the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., or use the Request Card at page 18. Circle No. 10.

### Combination hose reel for concrete buckets

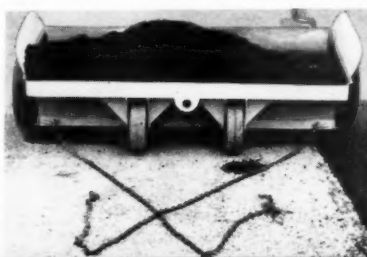
■ A combination tagline and hose reel is offered by the McCaffrey-Ruddock Tagline Corp. Called the Rud-O-Matic hose reel, it is available in several capacities.

The reel is recommended for use with crane-operated concrete buckets. The crane operator works both the crane and the concrete bucket while the Rud-O-Matic hose reel steadies the bucket and reels out the hose that supplies air or hydraulic power to operate the bucket.

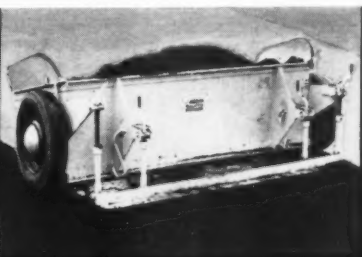
The attachment is secured to the crane boom with bolts and clamps. It comes equipped with all necessary fittings, including steel tagline cable. Installation takes 30 minutes.



For further information write to the McCaffrey-Ruddock Tagline Corp., 2131 E. 25th St., Los Angeles 58, Calif., or use the Request Card at page 18. Circle No. 89.



Fastens on standard dump truck



Wheel adjusted to ride on top of last pass



Carried on dump truck gate



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produces compaction equal to 80% of heavier, more expensive pavers

Here's why only Littleford can make this statement:

- 1 Exclusive compaction chamber with adjustable strike-off blade.
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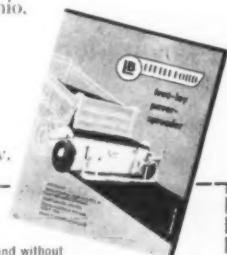
Here's what this means to you:

- 1 more economical paving and spreading.
- 2 roll sooner. With True-Lay's greater compaction, you get the roller on the asphalt faster . . . and less rolling is required.
- 3 labor saving. You need only a raker, shoveler and screed operator for the True-Lay. Compare this with the 7 or 8-man crew required for other units.

Here's where:

Only Littleford makes the True-Lay paver-spreader. For complete information, use the convenient coupon below and send for Bulletin 33, Littleford Bros., Inc., Dept. 229, 485 E. Pearl St., Cincinnati 2, Ohio.

Lay a better mat  
for less with True-Lay  
New bulletin 33 tells how.



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obligation, copy of new True-Lay bulletin 33.

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WATER COOLERS

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Let IGLOO strengthen your employee relations, too. Call your supply house.



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The engineering department

# The billing of materials



by **GEORGE E. DEATHERAGE, P. E.**  
Construction Consultant

*This is the seventh of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent and who need practical help in order to take complete charge of construction projects themselves.*



## Cleveland® "95" digs 10 miles for airfield lighting system at Portsmouth, N. H. Air Force Base

Morrison-Knudsen Company, Inc. and Landers & Griffin, Inc. employed a Cleveland Model 95 "Baby Digger" to good advantage in the construction of the airfield lighting system for the Strategic Air Command's 4,500-acre, \$60,000,000 Jet Base at Portsmouth, N. H. The Cleveland dug approximately 52,000 feet of trench 17 inches wide by 27 inches deep for the installation of cable and duct.

The "Baby Digger" was also profitably used on the same project for the excavation of some 3,600 feet of underdrain pipe trench, approximately 2 feet wide by 5 feet deep. As the photograph above shows, much of this trenching was done in rocky, stony soil, definitely not what could be termed "easy going."

The dependable Cleveland steadily delivered good daily trench footage—as it had been counted upon to do—in spite of the rugged digging and adverse conditions encountered. Just another example of Cleveland's ability to *dig more trench . . . in more places . . . at less cost.*

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**THE CLEVELAND TRENCHER CO.**

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 308

Before any materials, equipment, or supplies can be purchased for a job, all the items must be listed from the drawings, specifications, and equipment lists. The first listing of materials is done on the estimate sheets, which are used to prepare the bid. This listing is not done in such detail that it can be used for purchases, but it is detailed enough so that it can be used for checking purposes. Some of the larger concerns make it a practice to bill or list all the materials on estimate sheets in such form that one "take-off" serves both estimating and purchasing purposes, and this procedure saves a great deal of time and expense.

The job of listing materials for a purchase should be done on a systematic basis, and by an office force. Contractors often have individuals in different departments—and even men on the field force—bill the materials, but this procedure is not efficient. In many cases, it has led to error, duplication of effort, delay in getting deliveries, and in numerous small orders being placed. A considerable saving can be made if orders are consolidated so that a reduction in price can be

obtained for an order purchased in bulk.

Copies of the bills of material should go to all interested persons, including those in the field, so that any work with estimating, purchasing, expediting, receiving, delivery, and erection can be done efficiently. A process chart, a flow sheet, or both can be used to keep track of the papers.

### Material billing

Billing of materials should be done by the engineering department. If the contractor does not have such a department—and this is usually the case—the work can be delegated to estimators, office engineers, or someone familiar with this class of work. The drafting force that prepared the drawings might be used for this job, since the men are already familiar with the drawing and specification details.

Although some inaccuracies may be tolerated when items are listed on an estimate, this is not permissible when a bill of material is prepared. Materials are actually ordered from these sheets, and any inaccuracy in them will cause confusion and delay, and a

## BROWNHOIST BUILDS BETTER BUCKETS

—for less money DIRECT FROM FACTORY TO YOU



CLAMSHELL BUCKET



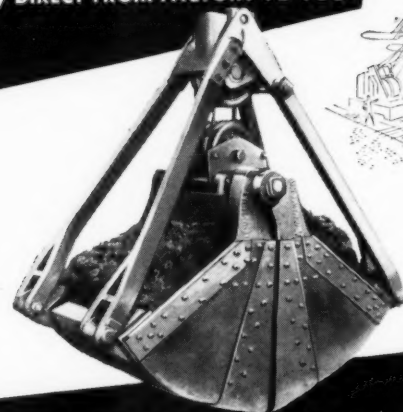
LOCOMOTIVE CRANE



COAL-ORE BRIDGE



ORE UNLOADER



191

ROPE REEVE, POWER WHEEL AND LINK TYPE

WRITE FOR ILLUSTRATED CATALOGUE

**INDUSTRIAL BROWNHOIST CORPORATION**

BAY CITY, MICHIGAN

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CONTRACTORS AND ENGINEERS

[illegible]

Figure 1

on his own experience as a designer to bill stock that will carry the required loads.

On some work, it is sometimes wise to prepare a brief specification on material characteristics, so that the entire billing staff will bill the same materials for similar work.

It is also important that material or equipment items be given numbers which can be carried forward on the Bill of Material. These numbers make it possible for material or equipment to be identified as soon as it is delivered to the field.

### Take-off sheets

The best way of billing material is to use a "Quantity Take-Off Sheet" similar to that in figure 1. This same form may also be used as an estimat-

form. The number of pieces and the dimensions and quantity of each item ordered can be listed and totaled on this sheet, and the record filed for reference. This eliminates the danger that calculations will be made on odd sheets of paper that may be mislaid or destroyed.

If a "take-off" is being made on concrete quantities, all the details are entered on a "Quantity Take-Off Sheet", the quantities are totaled, and only the total is carried onto the Bill of Material sheet. If an estimate is desired, the labor and material units can be filled in and the costs calculated.

### Bill of Material form

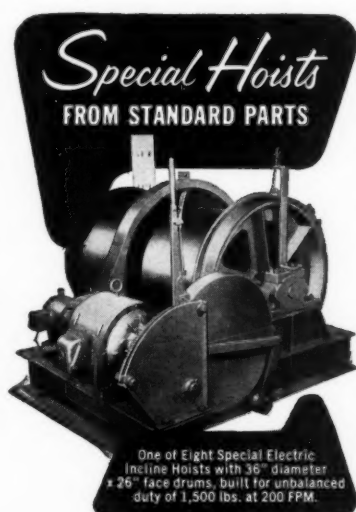
The practical Bill of Material form shown in figure 2 is simple to use. It



# MARION operators *ride on air*

. . . well, it's almost like riding a cloud when Marion Air Control takes the heavy push and pull out of shovel running. You control main machine motions with a maximum of only 12 pounds hand pressure. You can inch the load or hold it with simple wrist pressure. Operators stay fresh and fast all shift long. Cycle time is shortened without extra effort. Machinery lasts longer. Marion engineered air control has thoroughly proved its value in the field; requires minimum maintenance. Ask your Marion distributor what it can mean on your work. Your output rises when your operator rides on air.

**MARION POWER SHOVEL COMPANY**  
**MARION, OHIO**



● By modifying and re-combining our standard parts, Superior-Lidgerwood-Mundy can engineer hoists to meet your specific requirements at the lowest possible cost.

### Write for bulletins and catalogs

**SUPERIOR LIDGERWOOD  
MUNDY CORPORATION**

**Main Office and Works: SUPERIOR, WISCONSIN, U. S. A.**  
**New York Office, 7 Dey Street, New York 7, N. Y.**  
 For more facts, circle No. 310

For more facts, use Reader-Reply Card opposite page 18 and circle No. 311



## KONKURE Concrete Curing Compounds



Spray application curing membranes for freshly finished concrete surfaces — meets all city, county, State and Federal specifications. Unexcelled concrete moisture retention gives maximum strength concrete, minimizes concrete surface failures\* or rainfall damage.

\*In hot, dry areas, use of Konkure White is especially recommended.

### GENERAL PURPOSE

**KONKURE Clear** — for curing concrete where retention of natural color is desired — a fugitive orange dye is used in Konkure Clear to insure application visibility — the color disappears within an hour.

**KONKURE White** — architecturally attractive, white pigmented, to minimize surface cracks resulting from exposure to light and heat rays in hot, dry areas.

**KONKURE Black** — an asphalt base waterproofing and curing compound competitively priced — also serves as a bonding agent for asphalt tile application.

**KONKURE Gray** — glare reducing — gray pigmented to minimize surface cracks resulting from exposure to light and heat rays in hot and dry areas.



### TILT-UP and LIFT-SLAB

**KONKURE P. C. C.** — a resin base curing compound and bond breaker combined — may be painted without treatment upon erection.

Write or Phone for Full Information

## KONKURE COMPANY

6742 Stanton Avenue, Buena Park, California • Phone: LAwrence 2-2841

For more facts, use Reader-Reply Card opposite page 18 and circle No. 312

## The Fast, Easy Way To Drill Concrete

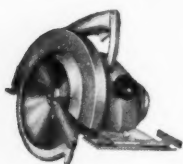


## ELECTRIC HAMMER DRILL

- Exclusive Automatic Rotating Drill Bit
- Ten Times Faster Than Hand Methods for Drilling
- Continuous Operation — Practically No Maintenance

The only Electric Hammer Drill available with automatic, self-rotating drill bit. Operates at high speed for fast production drilling. Electromagnetic drive—only one moving internal part. Requires little or no service even after constant usage on toughest drilling jobs. Electric Hammer models for chipping, cutting, pointing, scaling, etc., also available.

### Other SYNTRON Equipment of proven dependable Quality



### Gasoline Hammer PAVING BREAKERS & ROCK DRILLS

2000 blows per minute for digging, tamping, busting, or drilling in paving, clay, rock, shale, etc. Bit rotates automatically for drilling.

### Belt Driven ELECTRIC SAWS

Deliver full cutting power to blade—no bucking or jerking. For production cutting of wood, concrete block, plaster board, etc., 8" and 10" blades—2-13/16" and 3-1/4" cuts.



### CONCRETE VIBRATORS

Electromagnetic or flexible shaft models for uniform compacting and settling on large mass or form concrete projects.

Write Today for Complete Tool Catalog—FREE

## SYNTRON COMPANY

227 Lexington Ave.

Homer City, Pa.

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## management

contains a space for the number of the sketch that shows the material to be ordered. The numbering on each sketch or detail should tie in with the number of the general drawing. There is also a space for the number of the general drawing on which the material is shown, the date the drawing was issued, that is, the latest revised date as it appears on the drawing title block.

The Bill of Material may be given a number that ties in with the number of the general drawing. However, the best practice seems to be to number Bills of Material consecutively, regardless of work-order number, contract number, or drawing number. The blueprint clerk keeps a register of all Bills of Material and issues the number to be used for a new bill.

Spaces are also provided for the Issue Number and the date of the issue, the contract number or work-order number, the cost code classification to

which the material is to be charged, and the bin number in which materials are stored as soon as they are received. The C. S. O. or Construction Shop Order is posted if an assembly is to be fabricated on the job or in a job shop. Another space is provided for the name of the job.

The blank provided for job detail is used to cover a description of the materials listed. These should be listed according to subdivisions of the cost code, since it would be inconvenient to list building materials and mechanical equipment together. The name of the person making the bill of material, the name of the person checking the bill, the date that material must be on the job, and the total number of each item required are also entered on this sheet.

Sizes should be indicated accurately. If the size of a special item cannot be determined and a drawing must be consulted to get the right size this information should be noted in the blank space on the extreme right-hand side of the sheet, along with the number of the detail sketch containing the information. If the sketch has

GEO. E. DEATHERAGE & SON, INC.					
ENGINEERING DEPARTMENT					
BILL OF MATERIAL					
SK. _____					B.M. NO. _____
_____					DATE _____
_____					ISSUE _____
DWG. NO. _____					SHEET NO. _____ OF _____
DATED ISSUED _____	W.O. _____	CHARGE _____	BIN NO. _____		
			C.S.O. _____		
JOB _____					
JOB DETAIL _____					
LISTED BY _____		CHECKED BY _____		MATERIAL MUST BE ON JOB _____	
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Figure 2

## PIONEER GEN-E-MOTOR

## PORTABLE POWER

When and Where You Need It!



MODEL WA 30  
direct coupled  
model, 3800  
Watts



MODEL SS 4071  
belt driven plant  
6500 Watts

- Dependable electric power
- Fast starting engines
- Lightweight, portable plants
- Skid mounted, heavy duty units
- Over 40 models from 500 watts to 12 KW continuous duty units

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**PIONEER GEN-E-MOTOR CORP.**  
5856 West Dickens Ave., Chicago 39, Ill.  
Generators • Electric Generating Plants  
Power Lawn Mowers • Electric Portable Power Tools

For more facts, circle No. 314

not been prepared, the word "detail" should be written in this space. This will serve to notify everyone that a sketch must be prepared before the item can be purchased and installed.

Material may be described in catalog terms in the space labeled Material and Description. Standard symbols or abbreviations may also be used to describe items. The number identifying each item on the drawing should be entered under "Mark". If no number appears on the drawing, the item should be assigned a number, one that is different from that for other items on the sheet.

In the case of piping and sewer work, each pipeline should be given a number and a Bill of Material sheet made up for each line or branch. All material to be used in one branch will be tagged with the branch number when materials are listed on the Bill of Material. The blank space provided for "Remarks" may be filled in with all references to each item, to special drawing numbers, or special specifications that cannot be given in the space provided. A blank space on the right-hand side of the sheet is used for a note as to whether material is

99



## management

some other department can be used up.

### Use of Bills of Material

When materials are delivered to the clerk or storekeeper, he can tell from his records just where each item is to be delivered. He tags it according to contract number or work-order number, and enters the purchase-order number and drawing number on the tag. As soon as a job foreman requisitions stores, specifying the site where materials are to be delivered and the time they will be needed, the material clerk takes the items from storage and delivers them. In this way, highly paid mechanics do not have to be sent to pick up the materials.

A foreman should have both the working drawings and a copy of the Bills of Material covering the drawings in his possession before starting any part of the work. Both will answer any questions as to whether the material has been ordered, and the amounts ordered. With working drawings, Bills of Material, and detailed sketches in his possession, the foreman can concentrate on erection, assured that everything has been done to enable him to get his job done fast and at the lowest possible cost.

If a job is underway and changes make some ordered material unusable, a revised Bill of Material sheet should be made and distributed immediately to everyone concerned with the work. If it is possible, cancelled items should be listed for use in other parts of the work rather than being placed in stock.

### Other purposes of billing

Since every item of material used on a job must be listed and purchased, the listings themselves, and the listings of costs will provide all the information needed for many purposes. If billing is done systematically, the record can be made available for tax and accounting purposes so that appraisers do not have to make up new lists of costs all over again.

The listings can also be used to arrive at insurance values. The cost of foundations below ground may be subtracted from this total, since such construction is not usually subject to fire hazard. Unit costs are also valuable in figuring the cost of repair or maintenance work.

All the required information concerning costs will be in its most convenient form if material and equipment items used in one unit are listed on the same sheet or sheets of the Bill of Material. The bill will identify the unit by number. Copies of separate labor tickets for work done by various crafts on this unit are attached to the Bill of Material, together with copies of purchase orders. If no purchase order exists for items like concrete, the price of the material is determined by the cost department before total costs are entered on a summary sheet.

These sheets show the net cost of the unit, or any part of the unit that has been constructed. There is no need for anyone to backtrack to determine the quantity of material used, the price of the material, or the cost of labor involved in construction. When the burden—a percentage of the overhead or other indirect costs—is added to the net cost, the total will show the final cost of a structure.

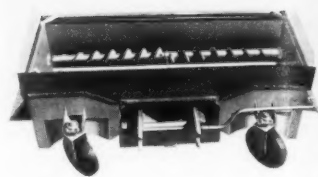
Aside from being invaluable for tax and insurance purposes, the system of unit billing and costing may prove the potent factor in helping a contractor secure a job. This is an extra service a contractor can provide—and it is a service that many firms do not realize a contractor can fill. The materials and equipment breakdowns on the Bills of Material are also useful in

checking the take-off on estimates or appropriations. A set of the bills, containing all information on spare or replacement parts, can also be turned over to persons responsible for operating or maintaining the new structure. And in case of fire or accident, the bills can be used as a guide in replacing part or all of the structure.

(Next month's article will deal with "The Engineering Department—Estimating".)

### Porter appoints new executive vice president

Charles L. Holbert has been appointed executive vice president of the H. K. Porter Co., Inc., New York, N. Y. Until now, he was vice president of the firm. Holbert succeeds Clarence R. Dobson, who has retired.



A swivel-wheel arrangement keeps the Model L aggregate spreader from tipping forward or backward when it is unhooked from a truck.

### Stabilizer wheels keep spreader from tipping

■ An aggregate spreader with a swivel-wheel stabilizer arrangement on the front that prevents the unit from tipping forward or backward when it is unhooked from a truck is

# EXTRA PAYLOAD Produces



## FRUEHAUF-SCHONROCK VOLUME★DUMP TRAILER

- Up To 4,000 Extra Pounds Payload
- Lower Initial Equipment Cost

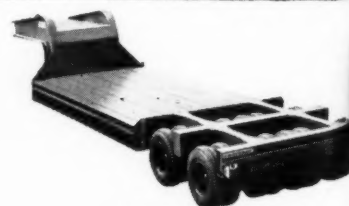
IN THE RADICALLY NEW Fruehauf-Schonrock Volume★Dump Trailers, every pound of excess weight has been removed to provide highest possible payload capacity. This has been achieved by greatly simplifying the dumping mechanism and eliminating heavy chassis members. In addition, tandem axles are properly located so that the body may be extended to maximum length to take full advantage of every inch of loadable space permitted by state bridge formulas. The utilization of easily

operated cables and the exclusive, tension-equalizing Fruehauf-Schonrock Booster Fifth Wheel reduces the initial equipment cost below that of units with costly hoist mechanisms. With only movable parts in the dumping mechanism, maintenance costs are also reduced to the minimum and much expensive down time is eliminated. Dumping with tractor jackknifed to 90° is possible and unique hanger mechanism keeps all wheels off the ground throughout dumping period.

### Fruehauf's Complete 1956 Line Of High-Efficiency Construction Units Includes:



Hopper and Hoist-Type  
Dump Trailers



Removable and Stationary  
Gooseneck Carryalls

announced by the Highway Equipment Co.

The New Leader Model L aggregate spreader also features a large-diameter feed roller with deep-cut right and left spirals to grip the material. It is recommended for jobs involving anything from fine sand up to 2-inch-diameter crushed rock.

A new-type spreader hitch permits fast hook-up to all trucks, the manufacturer states. A fully-enclosed, reversible transmission, running in oil, automatically shifts into forward gear when the rig is being towed ahead and into reverse when backing up. There is a heavy-duty removable operator's platform at each end of the spreader.

For further information write to the Highway Equipment Co., Inc., 616 D Ave. N. W., Cedar Rapids, Iowa, or

use the Request Card at page 18. Circle No. 129.

### Ready-mix and radio

■ The use of RCA 2-way radios in ready-mix concrete trucks is treated in a booklet from RCA. The fact that the contractor, supplier, plant, and job site can all keep in touch with the trucks, and the trucks with each other, is stressed. The steel-encased units are powered by the regular truck battery, and the radio can be installed any place in the truck. Job reports and action shots are included.

To obtain Form 3J2755 write to Radio Corporation of America, Front and Cooper Streets, Camden 2, N. J., or use the Request Card at page 18. Circle No. 57.



The new Kolman Model 101 portable conveyor and vibrating screen can load a 20-ton truck in less than a minute.

### Introduce new portable conveyor-screen plant

■ A new addition to the line of portable conveyors and vibrating screens offered by the Kolman Mfg. Co. is recommended for use in the simultaneous loading and screening of sand, gravel, ore, crushed rock, limestone, and similar materials.

The Model 101 conveyor features a 42-inch-wide belt, 50 feet in length. Mounted on dual tires, it can be equipped with a full line of accessories to comprise a complete portable conveyor-screen plant. The conveyor is said to have a potential loading-screening capacity of 1,200 tons per hour.

A single-deck vibrating screen has been designed in proportion to the size of the 42-inch plant. Designated as the Model SB-90, it is 9 feet long by 54 inches wide and features the "floating action" characteristic of all Kolman single and multiple-deck vibrating screens. Much excess weight has been eliminated, making it possible to easily suspend this large screening surface of over 40 square feet on the portable conveyor without the use of extra supports. The single-deck SB-90 need not be removed when the plant is transported.

The plant can also be equipped with a double or triple-deck screen in order to produce various sizes of material in one operation, and spraybars can be added to provide an efficient, low-cost, highly-productive portable washing plant. A variety of feeding accessories is available, as well as a feeder-trap combination which has a reciprocating plate feeder designed for the 42-inch belt and built into the trap with full adjustment for length of stroke and angle of operation.

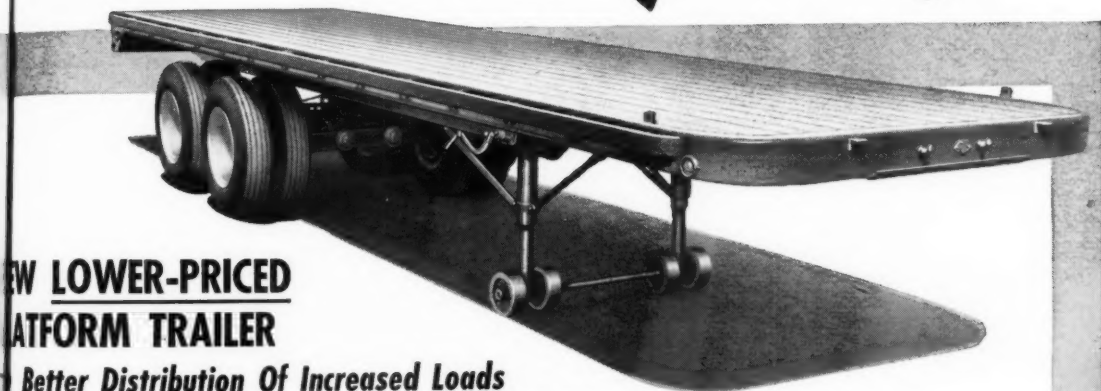
For further information write to the Kolman Mfg. Co., W. 12th St., Sioux Falls, S. Dak., or use the Request Card at page 18. Circle No. 9.

### Motor grader

■ The Allis-Chalmers Model D diesel motor grader is featured in a mailing piece. The grader has a 50-brake-hp, six-cylinder engine. Its power-circle turn, roll-away moldboard, scarifier, and stand-up cab are some of the features pictured and described. Pertinent specifications are included.

To obtain the mailing piece write to Allis-Chalmers Mfg. Co., P. O. Box 512, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 27.

# Extra Profits!



## NEW LOWER-PRICED PLATFORM TRAILER

**Better Distribution Of Increased Loads**  
• **Quick Conversion To Stake And Rack Unit**

GREATER EFFICIENCY in load distribution and standing versatility are the big features of this Bluehauf utility platform. Outside stake pockets provide quick conversion to stake and rack uses. Port radius corners permit more loadable length for extra hauling profits. Positive, equalized action

of the tandem assembly keeps the weight of the load distributed on all four wheels. Designed to allow the wheels to go up and over bumps with little effect on the level of the Trailer, this tandem produces a smoother, more shock-free ride. Single or tandem axle models, in all lengths.

## BLUEHAUF TWIN-PANEL AIR-SLIDE BULK CEMENT TRANSPORT

**Up To 125 Barrel Capacity • Discharge Rate 10 To 15 Barrels Per Minute**



THE HIGH-CAPACITY Bluehauf Bulk Cement Transport features high-speed engine-driven blowers for rapid unloading and fast movement of materials. With this simple air-slide method of discharge, no mechanical device comes in contact with the load—unit hauls longer at reduced operating costs. Adaptable to the transport of most pulverized materials, it is available in semi or full Trailer units for use singly or in combination, as shown at left.

World's Largest Builder of Truck-Trailers  
**FRUEHAUF TRAILER COMPANY**  
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✓ SEND LITERATURE ON FRUEHAUF'S COMPLETE HIGH-EFFICIENCY CONSTRUCTION LINE.

Name \_\_\_\_\_  
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Insulated Hot Commodity Tank Trailers

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 318



# Call us for B.F. Goodrich on-the-job TIRE SERVICE



**All tire sizes and types!  
All kinds of jobs!**

No matter how big the tire, how intricate the equipment, how complicated the repair job, we can handle it *quickly, expertly*. Our B. F. Goodrich Tire Service Men are trained for the specialized task of servicing off-the-road tires on the job.

Without cost or obligation we will

inspect all your tires. We'll select tires that should be repaired or replaced, point out tires that should be retreaded or recapped by factory-tested and proved B. F. Goodrich methods. We'll set up a proper inflation program.

The next time you need tires or fast, efficient tire service, call us.



## Completely equipped Servicemobile

B. F. Goodrich Servicemobiles are equipped with hydraulic cranes, power wrench, tube repair vulcanizers, a 20-ton jack and all other equipment needed for tire service work on the job.

Your B. F. Goodrich Tire Service Man can quickly mount and demount tires, repair tubes and valves, etc. You save costly down-time, cut tire costs to a minimum.



See us for B. F. Goodrich  
off-the-road tires and service

For more facts, use Reader-Reply Card opposite page 18 and circle No. 319

## Offer graphic system for work scheduling

A flexible graphic method of work scheduling for machines and manpower, that permits a contractor to see at a glance the disposition of his labor and equipment and enables him to work out the most economical utilization of both, is offered by Remington Rand. Called Sched-U-Graph, the method is a variation and enlargement of the firm's Kardex filing system.

One 40 x 5-inch Sched-U-Graph pocket represents each machine or employee. A 5 x 3-inch card, showing the name of the machine or employee and the number of hours that constitute a work day, fits into the right side of the pocket. A clear, horizontal transoid tip at the bottom edge of the pocket is calibrated so as to divide the week into seven days and the days into ten equal work periods.

An operation record card with a horizontal red stripe along its bottom edge is divided into 20 work periods, each equal in width to a work period as calibrated on the Sched-U-Graph pocket. The actual length in hours of the work period for a given job depends upon the length of the work day of the man or machine that will do the job.

When it is determined, by means of a conversion chart printed on each report card, how many work periods a specific man or machine will require to do a job, the report card is cut off at that point. It is then placed in the pocket marked for the specific man or machine. The red stripe shows through the transoid tip of the pocket and the card is positioned so that the left edge of the red stripe falls at the beginning of the work period of the day when the job is to be started.

In this way, the free time of the machines and manpower can instantly be seen. Any portion of the work day or week not covered by the red stripe represents available time for some other operation.

For further information write to Remington Rand, Division of Sperry Rand Corp., 315 Fourth Ave., New York 10, N. Y., or use the Request Card at page 18. Circle No. 90.

## Cone crushers

The operation and design features of Symons standard and short-head-type cone crushers are described in a bulletin from Nordberg Mfg. Co. A cut-away view of a crusher installation reveals the moving parts and complete lubrication system of the crusher. Tables list the different crushing cavities that are provided, and the respective feed openings, product sizes, and capacities. Diagrams show the arrangement of the crusher for stationary and portable-plant service. Dimensions, horsepower requirements, operating speeds, and weights are listed.

To obtain Bulletin No. 247 write to Nordberg Mfg. Co., Chase and Oklahoma Avenues, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 56.

## B.F. Goodrich TIRES AND ROAD SERVICE

Call any retailer listed here or check  
Yellow Pages of phone book for more  
complete listing in your area

<b>ALABAMA</b>	
BIRMINGHAM—B. F. Goodrich Store	4-0381
MOBILE—B. F. Goodrich Store	HEmlock 2-2881
MONTGOMERY—B. F. Goodrich Store	2-1061
<b>ARIZONA</b>	
PHOENIX—B. F. Goodrich Store	ALpine 3-6186
TUCSON—Baum & Adamson	3-3881
YUMA—Conner Tire Company	SUNset 2-2547
<b>ARKANSAS</b>	
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LITTLE ROCK—B. F. Goodrich Store	FRanklin 4-5886
<b>CALIFORNIA</b>	
BAKERSFIELD—B. F. Goodrich Store	FAirview 4-4701
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<b>DISTRICT OF COLUMBIA</b>	
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ALBANY—B. F. Goodrich Store	HEmlock 2-6481
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AUGUSTA—B. F. Goodrich Store	2-2674
COLUMBUS—B. F. Goodrich Store	2-3581
GAINESVILLE—Gainesville Tire Co.	LEnox 2-2551
MACON—B. F. Goodrich Store	3-4658
SAVANNAH—B. F. Goodrich Store	6-0631
<b>IDAHO</b>	
BOISE—Hill's Recapping Service	4-5557
<b>ILLINOIS</b>	
BLOOMINGTON—B. F. Goodrich Store	6-3435
CHICAGO—Chicago Tire & Rubber Co.	MOntroe 6-6400
CHICAGO—Consumers Tire & Supply	HAymarket 1-7514
CHICAGO HEIGHTS—B. F. Goodrich Store	SKYline 5-2532
DECATUR—B. F. Goodrich Store	5258
GALESBURG—Quint's Service Station	4961
JOLIET—B. F. Goodrich Store	5461
LASALLE—Tom's Tire Shop	931
MOUNT VERNON—Ranmar's Standard Tire Co.	60
OAK PARK—B. F. Goodrich Store	EUclid 3-4900
OLNEY—B. F. Goodrich Store	2137
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DRILL STEELS being used in the construction of approaches to the third tube of the Lincoln Tunnel, which burrows beneath the Hudson River to link New York City with New Jersey, are sharpened on the job with an Atlas Copco Eastern LSB-62 air-powered drill-steel grinder. The 27-pound sharpener automatically sets the proper angle on the tungsten-carbide cutting edges of the integral drill steel. A foreman for Gull Contracting Co., Inc., Flushing, N. Y., reports that his men are drilling from 1,500 to 2,000 feet before discarding the steels, which have been lasting 150 to 200 feet between resharpenings. The Gull firm is drilling and blasting through more than 200,000 cubic yards of hard rock in preparing the Manhattan approach of the multi-million-dollar traffic artery. For further information circle No. 18 on card at page 18 or write to Atlas Copco Eastern, Inc., 151 Linwood Ave., Paterson, N. J.



## Hydraulic diamond drill cuts holes at any angle

■ A new hydraulically operated concrete and masonry drilling machine has been announced by Molco Drilling Machines, Inc.

The Model V Mole incorporates a swivel head that allows holes to be drilled at any angle. Special diamond-faced self-sharpening core bits drill through reinforced concrete, tile, asphalt, and other hard building materials at speeds faster than any other method, according to Molco.

A compact hydraulic system feeds the drill bit into the work surface automatically. Holes from 1 to 14 inches in diameter are easily cut through reinforced concrete with this machine, the manufacturer reports. The rig is driven by either an electric motor or a gasoline engine.

For further information write to Molco Drilling Machines, Inc., 1100 20th St. N. W., Washington 6, D.C., or use the Request Card at page 18. Circle No. 73.

## New aerial platform converts to derrick

■ A hydraulically-powered, telescoping aerial platform that can be converted to a derrick with a 2-ton lifting capacity is available from the Elliott Mfg. Co. The truck-mounted rig is known as the Hi-Reach.

The Model EE-60 may be extended to a height of 60 feet. The boom may be moved 15 degrees from the vertical to either side and from 15 degrees ahead of vertical to 30 degrees to the rear. The working platform measures 6½ x 5 feet.

According to the manufacturer one man, using the front-mounted hydraulic winch, can remove the platform in 10 minutes and attach a head sheave to convert the Hi-Reach into a mobile derrick. A double hydraulic pump supplies all power and is driven by the truck engine through a power takeoff. The rig is recommended for roadside highway maintenance and as a substitute for scaffolding on emergency and one-shot operations.

For further information write to the Elliott Mfg. Co., 1100 S. Saddle Creek Road, Omaha 2, Nebr., or use the card at page 18. Circle No. 112.

## Do the job quickly and Efficiently with FARRELL-CHEEK



## BAR BENDERS

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HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

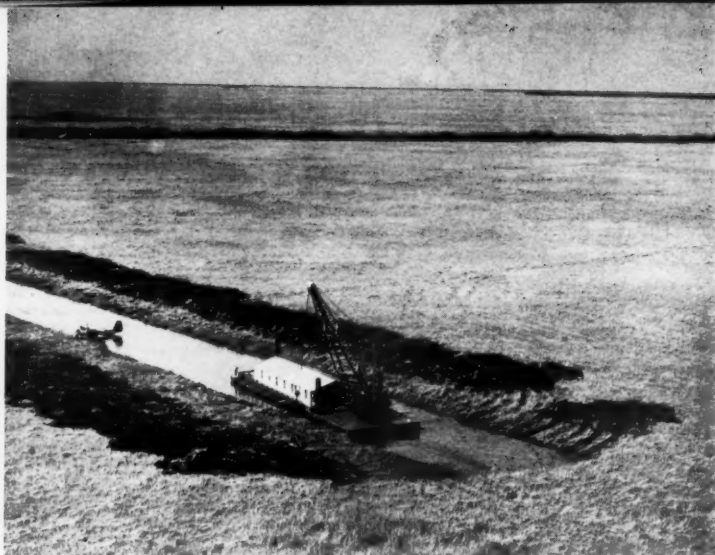
FARRELL'S CARBON STEEL CASTINGS	RAILROAD CASTINGS Locomotive and Car R. R. Specialty Castings	GEARS AND PINIONS "True Tooth" Gears and Pinions, Shafts and Wheels.	STOKER PARTS Feed Screws, Furnace Tools, Flanged Pipe, etc.
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YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

SANDUSKY, OHIO

For more facts, use Ready-Reply Card opposite page 18 and circle No. 320





IN THE DELTA SWAMPLANDS of southern Louisiana, a barge-mounted Manitowac 4500 makes a 65-foot-wide x 9-foot-deep canal so that drilling equipment can be transported to oil-well sites. Equipped with 120-foot boom and 6-yard clamshell, it handles 14,000 yards of gumbo daily.



EXCAVATION OF 60,000 CUBIC YARDS OF EARTH on a 60-acre site for a Fairfield, Conn., high school is handled by an Allis-Chalmers 21-yard scraper, push-loaded by an Allis-Chalmers HD-20. The \$2,890,000 contract went to John Zandonella, Inc., Bridgeport, Conn.



Galion Allsteel Model 19TTE Excavator trailer dump with 45 ton Model 88381 Duo-scope Hoist

## 1,920 cubic yards a day on a 15 mile haul

Galion Allsteel Model 19TTE Excavator trailer dumps are outstanding performers in the excavating equipment fleet of Greco Contractors, Chicago, Illinois.

Greco operates 8 of these units on the Congress Street Expressway job in Chicago. Loaded by shovel or dragline, each of these trailer dumps handles up to 30 cubic yards of material and makes 7 to 8 fifteen mile round trips to the dump each shift.

Built to haul large quantities of excavated material to distant disposal points, Excavator trailers are engineered to provide even weight distribution on trailer and tractor axles. And, they are constructed to withstand the damaging effects of shovel loading.

An order for 3 additional Model 19TTE's has just been placed by Greco Contractors. Describing the Congress Street job, Mr. P. J. Greco says: "We are hauling a mixture of rock, broken concrete and a very sticky mud. The combination of 6-inch radius floor corners, tapered body, barn door type tailgate and good dump angle gets rid of the material with no difficulty. Stability in dump position is remarkable. We also like the way the load is distributed on the trailer and tractor axles."

Find out how Galion Excavator trailer dumps can meet your heavy material hauling requirements. Your nearby Galion Allsteel distributor will recommend the model exactly suited to your job. Call him today!

AA-1529



THE GALION ALLSTEEL BODY COMPANY  
GALION, OHIO

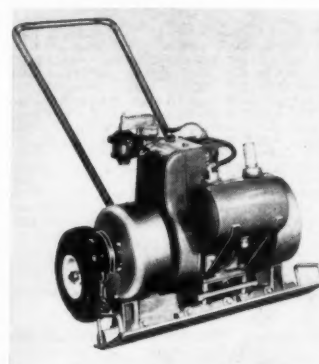
For more facts, use Reader-Reply Card opposite page 18 and circle No. 321

### New portable tamper is gasoline-powered

A new portable gasoline-powered compaction tool, the Vibra-Tamp, is announced by Barco Mfg. Co. This compactor is said to combine positive impact, imparted by high-speed rotating counterweights, with intensive vibratory effect to produce maximum compaction of granular fill materials and bituminous surfacing.

The new unit is recommended for tamping and finishing bituminous paving in restricted areas, compacting sand or earth fill in areas around footings and beneath paving or floor slabs, trench-grade leveling, and similar work. With the compactor, one man can tamp up to 750 square yards of surface per hour using lifts of as much as 12 inches.

The 27-inch tamping shoe delivers impact energy generated by dual rotary counterweight flywheels. The shoe is offset slightly ahead of these flywheels, thus producing a forward thrust that causes the machine to "walk" forward. The traveling speed is adjustable up to 50 feet per minute



on level surface.

Power to turn the flywheels is supplied by a 3 hp, 4-cycle air-cooled gasoline engine with speed adjustable from 1,600 to 2,400 rpm. Each flywheel is capable of generating tamping energy up to 800 foot-pounds. Fuel consumption averages one gallon for three hours' operation. The entire assembly is supported by two fulcrum-mounted 10 x 4.50-4 pneumatic-tire wheels.

For further information write to the Barco Mfg. Co., Dept. V-21, 500 Hough St., Barrington, Ill., or use the Request Card at page 18. Circle No. 20.

### KIESLER Since 1892 CLAM SHELL BUCKETS



- More POWER, deeper digging with less effort, due to leverage
- Rugged Construction
- Full loading—Fast operating
- New, improved wobble-free Head Beam and one-piece shell construction

Write for bulletin 10822

JOS. F. KIESLER COMPANY  
928-944 W. Huron Street  
Dept. CE1, Chicago 22, Illinois

For more facts, circle No. 322

### Plastic pipe carries fuel to drought area of Texas

A 98-mile plastic pipeline has been installed in west Texas to carry fuel to 200 irrigation pumps in a section marked by drought. Placed at a depth of 3 feet, the pipe links the pumps with a main pipeline carrying natural gas, used to power the pumps.

The pipe is made of Kralastic, a corrosion-resistant blend of rubber and plastic produced by the Naugatuck Chemical Division of United States Rubber Co., Naugatuck, Conn.

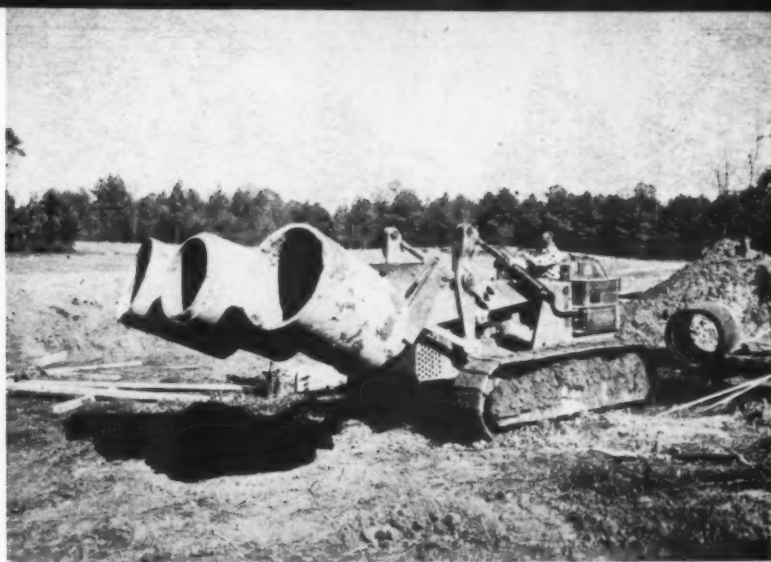
### ARBA Road Show banners available without charge

Banners announcing the American Road Builders' Association Road Show scheduled for January 28 to February 2, 1957, at the International Amphitheatre, Chicago, Ill., are available to manufacturers or organizations for display at sales meeting or other

CONTRACTORS AND ENGINEERS



ONE OF THE BIGGEST JOBS now under way for a railroad is the construction of the 4½-mile-long Pennsylvania Railroad classification yard at Conway, Pa., which will be capable of handling 9,000 cars a day. This Lorain MC-425 Moto-Crane with 1-yard clamshell is excavating a 22-foot-deep trench.



AMONG THE VARIOUS JOBS done by an International Drott TD-14 Skid-Shovel at the \$8 million Information Center for Williamsburg, Va., is the moving of 30-inch concrete drain pipe. Special 36-inch forks, bolted to the bucket permit easy handling of three sections at a time.

gatherings that are likely to be attended by persons interested in the show.

The banners come in two sizes. The larger one is 10×3 feet and is printed on heavy paper in orange and black; the smaller one is 22×28 inches and is also on heavy paper in yellow and black. Either of the banners may be obtained, without charge, from the ARBA Road Show Publicity Committee, 155 N. Wacker Drive, Chicago 6, Ill.

#### Kaiser names manager for plant-construction job

Henry J. Kaiser Construction Co., Oakland, Calif., has appointed M. J. Kinsey as resident manager for the construction of the Kaiser Aluminum & Chemical Corp. plant in Gramercy, La. Formerly associated with the L. E. Dixon Co., San Gabriel, Calif., Kinsey has worked on such projects as the construction of a sulfur-recovery plant in Iran, a veterans' hospital, and a manganese-extraction plant.

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Use Genuine CLIPPER DIAMOND Blades for Cutting Cured or Green concrete and asphalt with any aggregate. CLIPPER "GREEN-CON" Abrasive Blades for cutting "green" Concrete. There is a Clipper Blade for ALL Your Jobs.

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DIAMOND BLADES for any job—any aggregate—every saw! Choose your Clipper Diamond Blade from a wide variety of specifications to cut green or old concrete with outstanding speed and economy.

GREEN-CON ABRASIVE BLADES give you savings as high as 80%—with completely new series of "Green-Con" Reinforced Abrasive Blades that cut "Green concrete" with the widest possible range of HARD to SOFT Limestone Aggregates.



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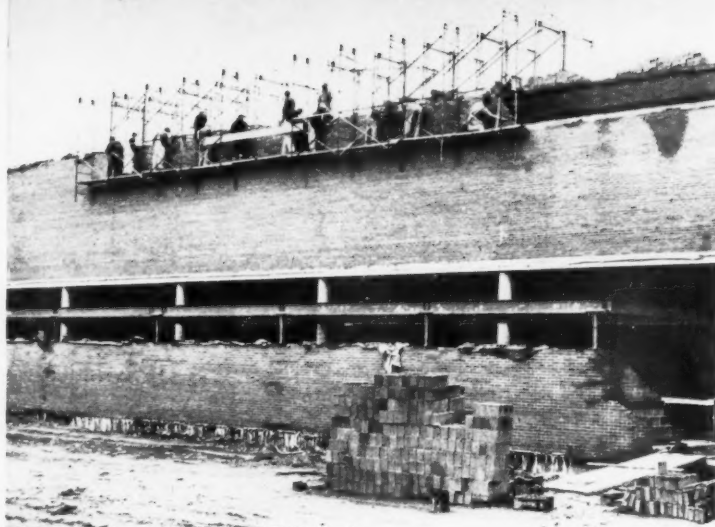
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ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 324





SPEED AND ECONOMY are combined when this 56-foot-long rolling scaffold is used in building a 600-foot wall for a shopping center near Washington, D. C. The equipment is made of 30 frames of Waco tubular scaffolding and the entire assembly rolls along the roof on 8-inch casters.



BLASTED ROCK on a road relocation project near McMinnville, Tenn., is loaded to a Euclid 10-ton rear-dump truck by a 2-yard shovel working the rock cut. The contractor for the reconstructed state highway is Farrar Construction Co., also of McMinnville.

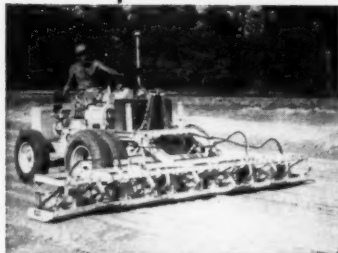
**4200**  
**TWO-TON BLOWS**  
**PER MINUTE!**



Here's **TREMENDOUS**  
**COMPACTION**

... for rapidly and most economically achieving or exceeding specified densities in the consolidation of rock, slag, gravel and sand base courses in waterbound and penetration macadam construction. The Jackson does it in just about half the time required with equipment of other types and is equally efficient in filling all the voids from top to bottom of rock and slag courses when sufficient fines have been spread.

Exceptional **ON-THE-JOB ADAPTABILITY!**



Above: a Jackson Multiple (6 units) on 7 mile sub-grade. Below: 2 units equipped with operating handle, self-propelling and easily operated by one man.



Standard width of the Jackson Multiple is 13', 3"; working speeds: up to 60' per minute; reverse: up to 5 MPH. Working width can readily be altered on the job to exactly suit narrower requirements such as widening projects. As many of the 6 compacting units as desired can be subtracted from the workhead, quickly and easily. Furthermore, easily interchangeable bases from 12" to 26" are available and individual compacting units may be fitted with operating handles and used exactly like the standard, highly popular, self-propelling manually guided Jackson Compactor. As a consequence Jackson equipment can be used on a great deal of work other machines cannot reach. If you have any job requiring compaction of granular soil, it will pay you to know specifically what Jackson Vibratory equipment will do. See your Jackson distributor. Literature and name of nearest Distributor on request.

**JACKSON**  
**VIBRATORS, INC.**  
**LUDINGTON, MICH.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 325

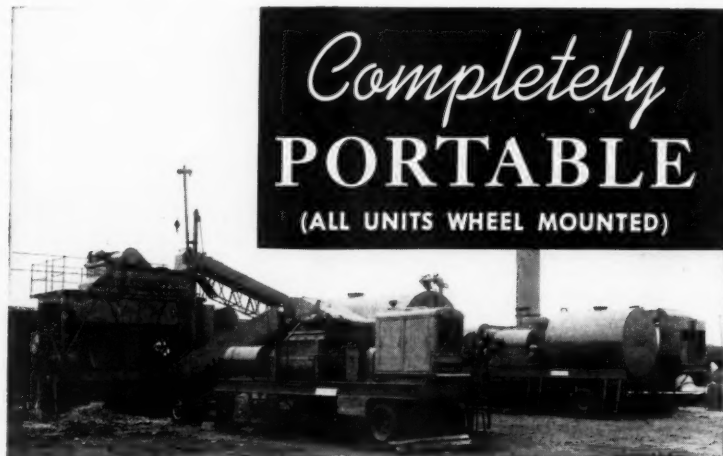
#### New book on foundations and allied subjects

A new text dealing with practical foundation problems and their solution emphasizes the value of experience in designing the foundations and in planning and executing the construction. Written by Rolt Hammond, "Foundation Engineering" is divided into nine chapters which discuss soil mechanics, site exploration, piled foundations, vibration control, house and building foundations, and

foundations for bridges and maritime structures.

A list of references on particular subjects included in the text appears at the end of each chapter, and many photographs, charts, and diagrams illustrate the text.

Priced at \$10, the book may be obtained from the publisher, the Philosophical Library, 15 E. 40th St., New York, N. Y.



#### NEW Batch Type Asphalt Mixing Plant

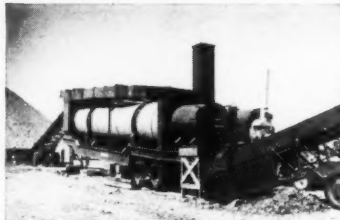
(Capacity 100-180 TPH)

This completely portable new batch type plant is built in two sizes—M-40 (100 to 120 TPH) and M-60 (150 to 180 TPH).

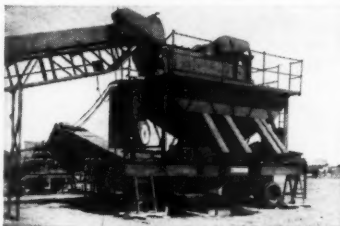
All units are wheel mounted, and no crane is needed for erection. Plant can be moved from one job to another and set up in a minimum of time. All piping and wiring are permanently installed—with quick disconnects.

The design and engineering of this plant provide a flexible setup arrangement. All remotely located units are driven with electric motors. No shafts, universal joints, chairs, gears, etc. Meets all State specifications.

The complete plant—tanks, oil heater, power units, piping, etc., are available from one source. For complete information see your nearest H & B distributor or write direct.



Portable Dryer Unit

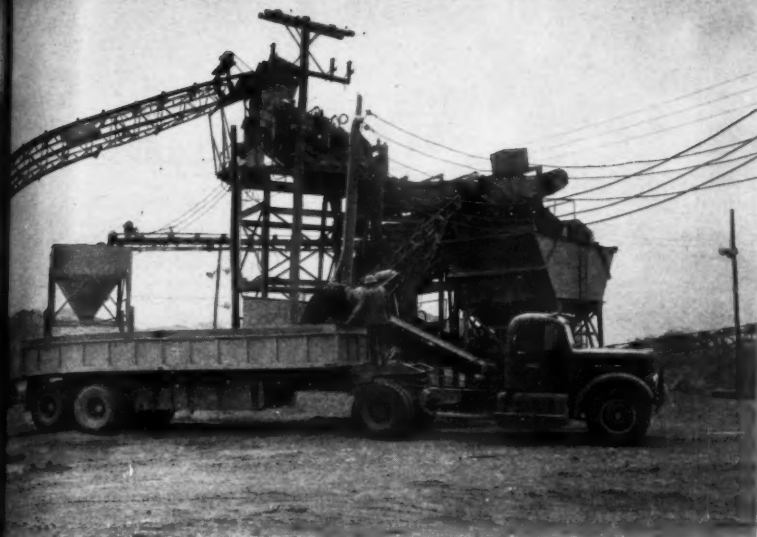


Gradation Unit, showing operator's platform.

**HETHERINGTON & BERNER INC. • Engineers... Manufacturers**  
**731 KENTUCKY AVENUE**  
**INDIANAPOLIS 7, INDIANA**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 326

CONTRACTORS AND ENGINEERS



FINISHED AGGREGATES for concrete going into the Wesley E. Seale Dam near Mathis, Texas, move from a surge bin to a Hamilton 15-yard dump trailer, pulled by a White truck, for the haul to the batch plant. Aggregates are fed to the Simplicity 5 x 14-foot triple-deck screen of the crusher by a conveyor.



A SEA WALL TO PROTECT a real-estate development gets under way near Pompano Beach, Fla. Precast concrete piles are being driven with a drop hammer handled by an Insley WB crane. Wall sections fitting between the piles are also made of precast reinforced concrete.

### American Pipe acquires new manufacturing plant

Hooper Concrete Pipe Co., Phoenix, Ariz., has been acquired by the American Pipe & Construction Co., Los Angeles, Calif. The merger will give American a permanent manufacturing plant in Phoenix, Ariz., which will be enlarged so that several classes of reinforced-concrete pipe can be manufactured there.

O. M. Hooper, head of the firm that bore his name, will remain as operat-

ing head of the Phoenix plant for an indefinite period. American Pipe operates division plants at South Gate, San Diego, and Hayward, Calif., and at Portland, Oreg. Two subsidiary companies, Amercoat Corp. and Pipe Linings, Inc., are both located in Los Angeles. An associate company which operates several plants in the state of Texas, is Gifford-Hill-American, Inc.



Now, MILLER engineers, pioneers in the development of easier loading Tilt-Top\* trailers for heavy equipment . . . introduce this huge, all new Tilt-Top. Designed for easier, faster handling of such equipment as smaller shovels, Barber-Greene trenchers and finishers, backhoes and larger crawler tractors up to 26,000 lbs. gross weight . . . this new Tilt-Top\* is massively built. A very low platform height, for this type of trailer, is achieved by placing the platform frame pivot point toward the rear of the tandem axle assembly . . . yet maintaining such perfect balance that it easily tilts under a man's weight.

Two inch oak, job proven for its durability and better climb traction, is used for decking the big 8' x 16'8" platform. Under the platform is a frame like a bridge . . . closely braced with 10" deep steel members along each side where the weight of tractor mounted equipment is carried.

Easier to back and maneuver . . . this super Tilt-Top\* replaces the slower loading of more cumbersome trailers with ONE man, TWO minute loading . . . brings new time saving mobility to larger equipment. See the big, new "OT"-13 at your MILLER distributor today!



Miller Model "OT"-13 \$2,200.00\*  
F.O.B. Milwaukee  
Complete with platform and  
eight 7.50 x 15 x 12 ply tires.  
Any optional equipment extra.  
\*Plus Freight and 8% Federal Tax

✓ built best  
✓ priced best

For more facts, use Reader-Reply Card opposite page 18 and circle No. 327

Heavy duty box section walking beam provides independent wheel action on each side, in contrast to straight-thru tandems, assuring less jarring and a more level ride on rough terrain. Walking beam shaft is one of the few equipped with trouble-free Timken roller bearings.



The pivot point of the long, heavy tongue is set way back at the rear set of wheels—providing tremendous double frame strength under the area of greatest load concentration.

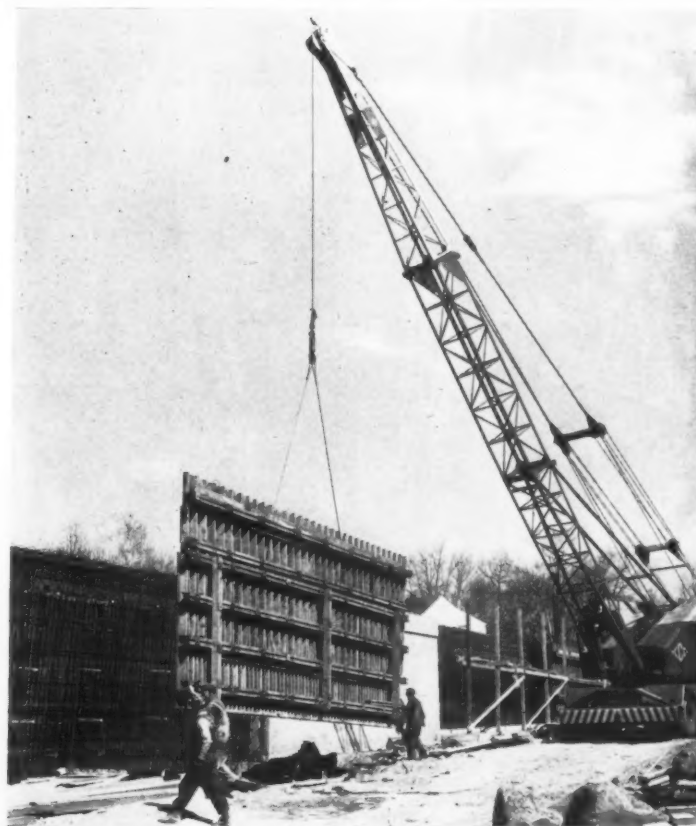


The massive frame is honey combed with 8" deep lateral bracing members for rock solid decking support!

See your MILLER distributor or write for FREE literature to:

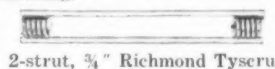
**Miller**  
Tilt-Top Trailer Co.

456 S. 92nd St., Milwaukee 14, Wis.



Form being moved into position. Back wall form, reinforcing steel, Richmond Tyscrus, are all in place. After front form—which consists of two telescoped panels—has been set down, bolts connecting the panels are loosened so that upper panel can be raised and tilted by crane to required height and shape. Pre-cut plywood will fill gap between two panels. When form is positioned, work-

men hook plank scaffolding to walers, fasten 3/4" Richmond Tyscrus with seven or eight quick turns. Contractors: Corbetta-Yonkers Contracting.



2-strut, 3/4" Richmond Tyscrus

## Pours Speeded with New Form Method and Richmond Tyscrus

Three miles of retaining walls were needed where the southern end of the New York Thruway cuts through Yonkers. No two sections of the wall are alike; they differ both in height and slope of coping. Corbetta-Yonkers speeded construction by a combination consisting of the use of ingenious telescoping panels fabricated at their yards—and 12,000 lbs. safe load (.340 HT Steel) Richmond Tyscrus for their assembly.

Assembling method is described above. The whole process took less than one hour. Stripping the form was just as easy, with the Tylag backed out of the form. Richmond Tyscrus helped cut costs in other ways too: their built-in extra strength (published load 12,000 lbs.; ultimate strength 20,145 lbs.) means that you can pour fast and

heavy in all weather. There is only one threaded connection, with a coarse thread which is self-cleaning when removed from the concrete. Richmond Tyscrus are far more economical than conventional ties.

The new Richmond Handbook describes the full line of Richmond-engineered tying devices. Write for your copy. Or, if you have a specific concreting problem, Richmond's Technical Division or field men will be glad to submit recommendations, drawings and proposals. Write RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y. or 315 South Fourth Street, Saint Joseph, Mo.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 328



Richmond

SCREW ANCHOR CO. INC.

100 SOUTH FOURTH ST. ST. JOSEPH, MO.





MORE CONCRETE IS DUMPED over welded wire fabric by a second Koehring Twinbatch paver to bring a lane of the Kentucky Turnpike to a 9-inch depth. Wright Contracting Co., Columbus, Ga., uses a Blaw-Knox spreader to strike off concrete at 6-inch depth behind the first Koehring paver.



WORKING 10 HOURS A DAY and 7 days a week, this Caterpillar No. 583 Pipelayer cradles part of the 36-inch gas line being constructed from Hercher to Divine, Ill. Contracting & Material Co., Evanston, Ill., averaged 5/8-mile of the large pipe daily in laying the 31-mile line.



ELIMINATE  
THIS  
DANGER ZONE!

You can eliminate this danger zone under any hoist, crane, or other lifting equipment with Bullard-Burnham safety hooks. A pushbutton safety gate makes it impossible for loads to jar loose until the hook is manually unlocked, and also acts as a constant safety gauge indicating whether or not the hook is sprung. Notice that the safety gate leaves the hook's throat 100% clear. The heavy duty safety gate is non-corrosive brass with a stainless steel lock pin that will last for years.

E. D. Bullard Company, 275 Eighth St., San Francisco



Hook  
on load block



Hook with jaw  
and jaw-type ball  
for link chain



Hook with  
adapter nut for all  
types of pullers



Write for complete data and specifications  
**BULLARD**

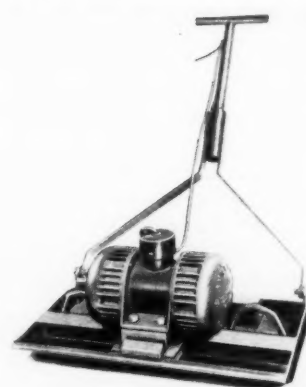
For more facts, use Reader-Reply Card opposite page 18 and circle No. 329

### Vibrating compactor-float is self-propelled unit

■ The new Syntron-Sinex vibrating compactor and float has a 30-inch-wide weighted float, is powered by 3,600 vibrations per minute, and is self-propelled. Designed for speed and economy, this new electromechanical compactor is said to compact and settle granular soils, earth fills, ash, cinders, and bituminous mixes.

According to the manufacturer, the vibrations delivered by this machine penetrate the surface mass and fill voids and pockets, making the compactor-float exceptionally useful in road widening and patching, compacting dirt fills, drainage and cover fill in trenches, and numerous other building construction and maintenance jobs.

A self-contained electromechanical vibrator is mounted on the 30×18-inch heavy-gage steel float. Totally enclosed, the vibrator does not require lubrication and is completely pressure-tight and waterproof. Detachable weights provide easy moving



The new Syntron-Sinex vibrating compactor and float.

of the compactor from job to job.

Operation is from 220-volt, 3-phase, 60-cycle, ac current.

For further information write to the Syntron Co., 227 Lexington Ave., Homer City, Pa., or use the Request Card at page 18. Circle No. 128.

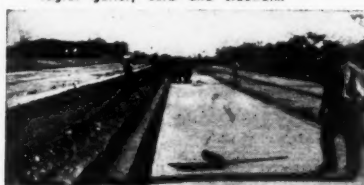
### YOU CAN BID LOWER AND MAKE MORE PROFIT with a DOTMAR Curb, Gutter, Sidewalk Paver!



Dotmar Paver with extensions paves integral gutter, curb and sidewalk.



Dotmar with extensions paves state highway median strip.



Hundreds of contractors are cutting costs and increasing profits with a Dotmar Paver. Pays for itself in first mile of paving. Greater concrete yield. Easy to operate. Trowels for any shape of curb, gutter, sidewalk or highway strip. Send for Catalog 56.

MAKERS OF AIR ACE HAMMER AND TOOLS  
"The size of a pistol—Power Like A Cannon".

**Dotmar INDUSTRIES Inc.**

519 HANSELMAN BUILDING

KALAMAZOO, MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 330

CONTRACTORS AND ENGINEERS

No. 583  
ed from  
veraged



BLENDING AND CUTTING materials on a fill on the Dallas-Fort Worth Turnpike in Texas is done by a Rome disk plowing harrow pulled by a Caterpillar D8 tractor. Cage Bros., San Antonio, Texas, is the prime contractor on this stretch of the newest Southwestern superhighway.



FILL FOR THE MONTGOMERY DAM project near Fairplay, Colo., is dumped to a waiting truck by a Bucyrus-Erie 110-B shovel with a 4½-yard bucket. Fisher Contracting Co., Phoenix, Ariz., is doing this part of the work, which involved drilling and blasting.

### Pennsylvania changes highway personnel

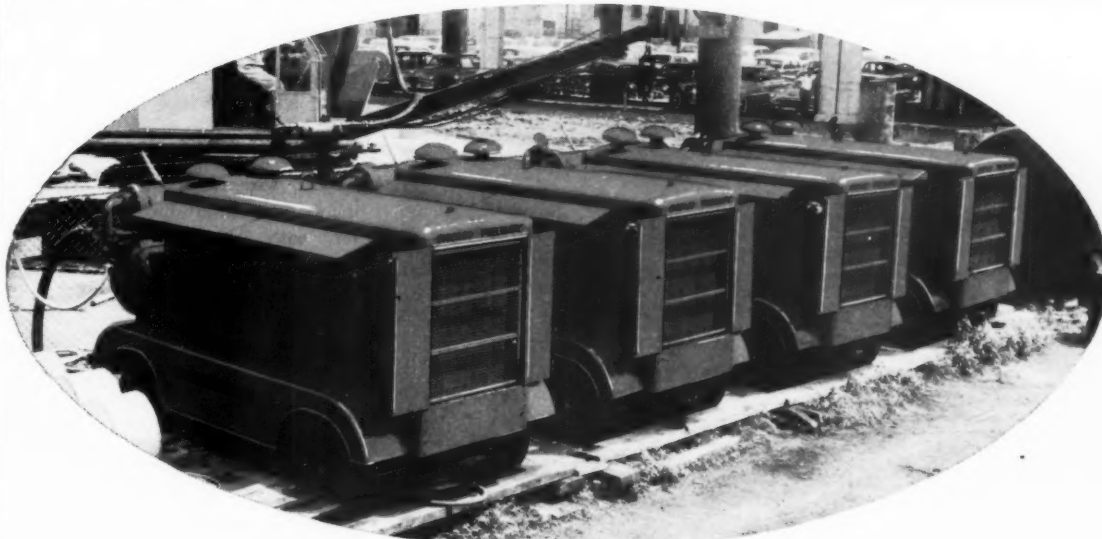
Two personnel changes in the engineering departments of the Pennsylvania Department of Highways have gone into effect. Edwin H. Jones has been appointed assistant chief engineer in Harrisburg in charge of maintenance. He had been superintendent of maintenance in Northampton County.

The new acting assistant chief engineer in charge of construction is R. A. Farley. Farley had formerly been in charge of maintenance.

### Sales manager for Jay

Donald Masson has joined The Jay Corp., Columbus, Ohio, as sales manager. Previously general manager of Lincoln Plastics, Masson is a member of the American Society of Professional Engineers.

The Jay Corp. manufactures earth tamping equipment for road construction and maintenance.



CP "Power Vane" 600 cu. ft. Rotary Compressors

## CP construction equipment is

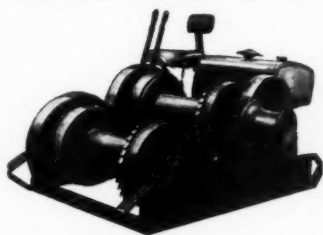
*"right  
on the  
job"*

Contractors specify Chicago Pneumatic when buying or renting construction equipment because they've learned that top performers like CP "Power Vane" Rotaries are always "right" on the job.

Chicago Pneumatic was first to give you a Rotary Compressor in a capacity to meet every job requirement from 900 to 125 cu. ft. And, CP Rotaries are proving themselves by logging thousands of hours of trouble-free service under every conceivable job condition . . . with an absolute minimum of attention.

Chicago Pneumatic Tool Company,  
8 East 44th Street, New York 17, N. Y.

## KING HYDRAULIC CONTROLLED HOISTS



Plenty tough for the big construction jobs. Double drum and single drum units. 1500 to 7500 lbs. capacity. Hydraulic brake type clutch on each drum. Truck type master cylinder on control. Wisconsin air-cooled engine. Timken bearings. Built better to hoist faster and longer. Ask for Bulletin 156.

King 500 Series Portable Hoists for light construction jobs. Also Hydro-King Automatic Tower Hoists, King Electric Hoists, Car Pullers, Winches and Capstans. The most complete line.

Send for Catalog

**KING MANUFACTURING CORP.**

3138 W. Chicago Ave., Chicago 22, Ill.  
For more facts, circle No. 331



There's a CP Demo tool for every type of demolition work.



CP Super Triplex Tamper — the "one-man tamping gang."



## Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 332





When Ordering Equipment Specify  
**INDUSTRIAL CABS** And  
You're Sure of a Perfect Fit

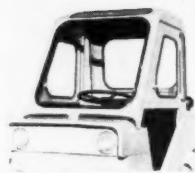
**Easily Installed  
Easily Removed**

Ready Made for  
Your Make and  
Model Tractor

CONTACT YOUR  
EQUIPMENT DISTRIBUTOR



Canopy Type



Semi-Enclosed  
Fully detachable

## INDUSTRIAL CAB COMPANY

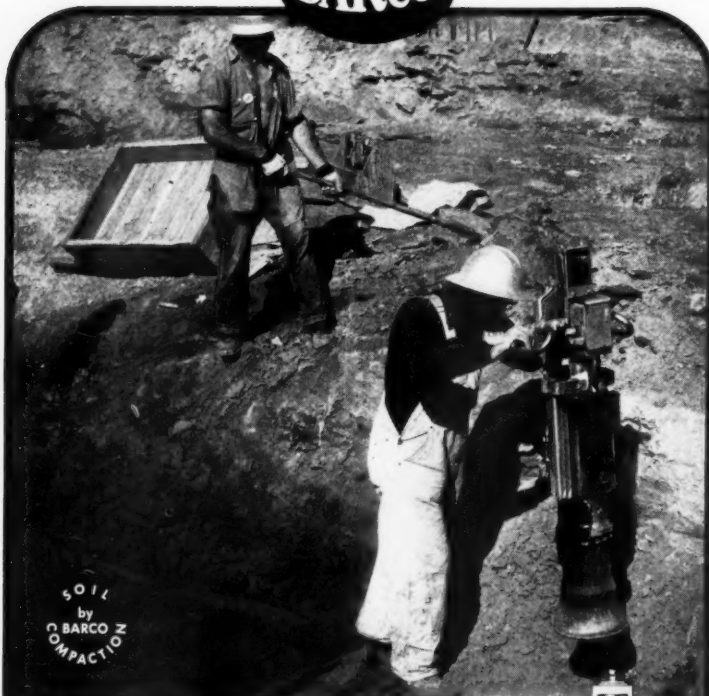
36 Jefferson Avenue

PHONE 3959

Salem, Mass.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 333

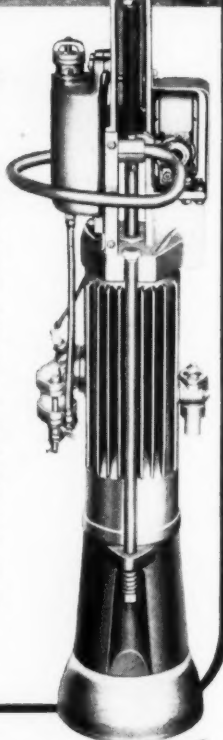
## GASOLINE **BARCO** RAMMER



### Barco Performance Pays Dividends!

**Job Finished on Time!**—When project specifications call for SOIL COMPACTION, Barco performance can't be beat! In test after test, Barco Rammers have demonstrated their ability to deliver 95% to 97.5% compaction (modified Proctor Method)—RAPIDLY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches—on all kinds of construction jobs: Atomic Energy, Air Bases, Hydroelectric Power and Flood Control Dams, Highways, Toll Roads and Freeways, Bridges, Buildings, and Housing Developments. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour.

**Ask for a Demonstration!**—We will be glad to arrange a demonstration for you; see our nearest distributor or write. SEND FOR A COPY OF CATALOG 621.



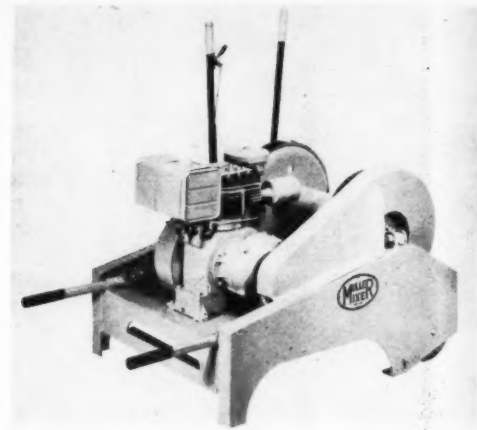
**BARCO Manufacturing Co.**

518H Hough Street

Barrington, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 334

The Muller builder's hoist.



### New builder's hoist unit has 1,000-pound capacity

■ A builder's hoist with 1,000-pound capacity and a single-line pull of 200 fpm has been added to the line of contractors' equipment manufactured by Muller Machinery Co., Inc. The rig is equipped with a pair of 8-inch rubber-tire wheels for easy mobility on the job.

The hoist has a rope capacity of 400 feet of 3/4-inch manilla rope, 2,700 feet of 1/4-inch wire rope, or 1,200 feet of 3/8-inch wire rope. The drum is 15 inches long and 5 1/2 inches in diameter, with 16-inch flanges. It is

mounted on roller bearings.

The 16-inch brake is equipped with a spring to provide spring tension on the free end to hold a load when the clutch is released. Clutch and brake levers are separate. Power comes from a Briggs & Stratton 23-R-6 air-cooled engine rated at 7 horsepower at 2,400 rpm or 8.1 horsepower at 3,000 rpm.

For further information write to Muller Machinery Co., Inc., P. O. Box 248, Metuchen, N. J., or use the Request Card at page 18. Circle No. 167.

### Surface hardener

■ Emery-Topcrete for surface-hardening of concrete floors is described in a brochure from the manufacturer, Walter Maguire Co., Inc. The hardener is made by dry-mixing cement with type "SH" Cortland Emery aggregate, and then applying the mixture to a newly-laid concrete surface. The brochure states that the hardener is resistant to corrosion, rust, slip, and absorption. List of recommended specifications and estimating data are included.

To obtain Bulletin SH56 write to Walter Maguire Co., Inc., 60 E. 42nd

St., New York, N. Y., or use the Request Card at page 18. Circle No. 157.

### Stud driver

■ The Remington Arms Model 455 stud driver is detailed in a catalog from the firm. Various studs in 1/4 and 3/8-inch sizes are shown. Power loads, guards, and a number of accessories are illustrated and described. Complete specifications are included.

To obtain this catalog write to Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 32.

## Four Major Facts about C & E

1. It carries more editorial material than any other monthly publication in the field.
2. It also carries a higher proportion of editorial to advertising content.
3. C&E carries more display advertisers than any other monthly, and,
4. More exclusive advertisers.

This leadership pays off in readership and produces inquiries and orders for advertisers. It helps explain why **CONTRACTORS AND ENGINEERS** carries more advertisers, and more exclusive advertisers than any other monthly in the construction market.

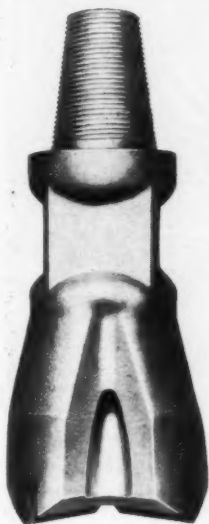
A 2-line inquiry will bring you the facts you want about the huge construction market.

**Contractors and Engineers**  
*Magazine of Modern Construction*

470 Fourth Ave., New York, N. Y.

CONTRACTORS AND ENGINEERS

## Six-inch drill bit new addition to line



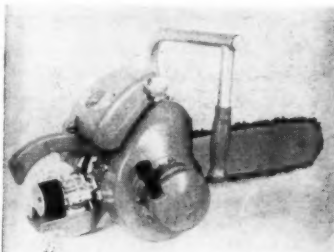
■ The line of precession rock drill bits manufactured by the Chicago Brunner & Lay Rock Bit Corp. has been augmented by the addition of a new 6-inch Rok-Master drill bit. The bit is for use on Ingersoll-Rand Quarrymaster drills.

The new Rok-Master features 2 x 3 API threads, super-tough bit body, and fast-drilling carbide inserts that have unusual resistance to wear and shock, the manufacturer points out.

For further information, write to the Chicago Brunner & Lay Rock Bit Corp., 9300 King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 144.

## Lightweight chain saw with three bar lengths

■ The Nifty chain saw, an economically priced cutting tool equipped with a 14, 16, or 19-inch guide bar, is now being marketed by the Chain Saw Division of the Lancaster Pump & Mfg. Co.



The new model is a compact, lightweight saw with a 3-hp air-cooled, two-cycle chain-saw engine. The engine is equipped with an automatic cutoff switch which shorts out the magneto when the trigger throttle is released.

Other features include the pistol-grip throttle handle, chrome-track guide bar, fully automatic oiling, rewind starter with nylon cord, and float-type carburetor which enables the operator to use the saw in all normal felling and bucking positions. The Nifty is designed to cut within a few inches of the ground to facilitate clearing brush and small trees.

For further information write to the Chain Saw Division, Lancaster Pump & Mfg. Co., Inc., Manheim Pike, Lancaster, Pa., or use the Request Card at page 18. Circle No. 8.

FIELD POWER TO DRIVE ITS PORTABLE ROCK CRUSHERS in the production of road-building aggregate and fill is obtained by the Rogers Construction Co., Portland, Ore., from a skid-mounted generator unit powered by a diesel engine. The mobile generator, a 385-kw, 480-volt, three-phase, 60-cycle unit, is driven by a Cooper-Bessemer Type FW-6T supercharged diesel rated at 550 horsepower at 900 rpm.

The engine, generator, and radiator units are mounted on one skid and the entire assembly is handled from job to job on a low-bed trailer. For further information on the supercharged diesel engine write to The Cooper-Bessemer Corp., Mt. Vernon, Ohio, or use the Request Card at page 18. Circle No. 103.



# Versatile D Tournapulls save time for Illinois contractor

## Handle production dirt and finish work

On U.S. 66 near Pontiac, Illinois, 650,000 cu. yds. of clay and topsoil were moved and spread to widen 25 miles of this highway.

On the job, the Standard Paving Co., of Chicago, encountered production difficulties when 2 of their 4 scrapers broke down. To keep production dirtmoving on schedule, one 28 mph D Tournapull was moved from shouldering work to production hauling. A second "D" remained on fine grade and other one-man-crew clean-up assignments.

### 8400' cycle every 8 minutes

Working with a pusher from a borrow pit, the 138 hp "D" loaded 5½ pay yards of tough-to-handle clay in about 30 seconds. "D's" ability to partially self-load saved time and work for pusher on loading cycle. Haul, spread, and return took about 7 minutes. 8400' cycle was completed in 7½ minutes. Cycle time for other

scraper units averaged about 9.5 minutes. Despite the fact that "D" was working with bigger rubber-tired dirmovers, it matched, and often bettered the speeds of bigger units on haul and return trips.

### Second "D" on fine grading

The second D Tournapull was being used with a motor-grader to fine-grade before paving courses were put down. It self-loaded excessive dirt windrowed by grader. Unit averaged 1¼ minutes on 350' cycle. Operator Henry Carbine said, "The 'D' is the best machine for fine-grading."

### Tops for any job

You'll find, as did this contractor, that the versatile D Tournapull is a mighty handy tool to have in your fleet. It is ideal for hauling, grading, building shoulders, shaping back-slopes, digging drainage ditches, spreading gravel, connecting access roads, backfilling around culverts, leveling land, stripping overburden, and doing dozens of other scattered small clean-up jobs that turn up. It

is a machine that can work and earn every day of the year.

### Speeds job-to-job

D Tournapull runs at 28 mph from job-to-job. Big 18:00 x 25 low-pressure tires allow unit to travel anywhere... over pavement, blacktop, curbs, railroad tracks and bridges. Extreme mobility of "D" saves time by allowing it to take the shortest route to job. To find out what the 7-yd. D Tournapull can do for you on your next dirtmoving job, see your LeTourneau-Westinghouse Distributor. He'll be glad to show you owner-verified production figures



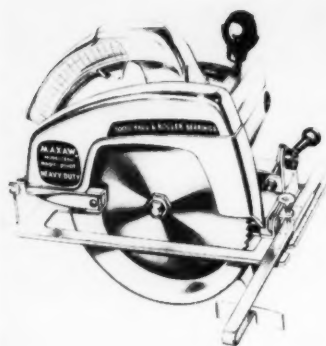
"D" self-loads, hauls and spreads windrowed material on 350' cycle in about 1¼ minutes. Tournapull—Trademark Reg. U.S. Pat. Off. DP-875-H-b



**LeTourneau-WESTINGHOUSE Company**  
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 335





### Improved power saw has exclusive blade guide

■ A 7 1/4-inch power saw with an 8-inch cutting capacity has been announced by the John Oster Mfg. Co.

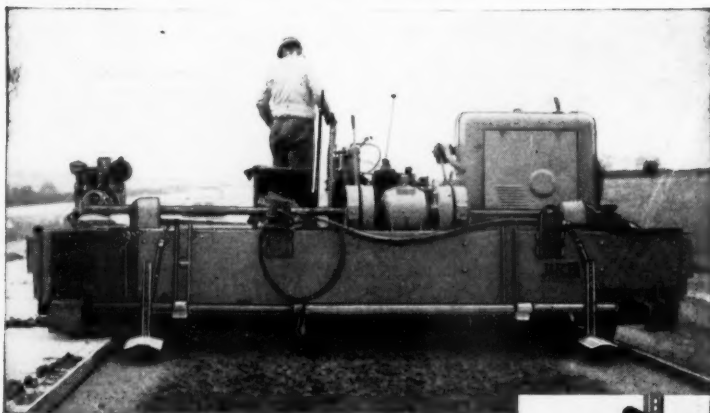
The Cummins Maxaw 7800 is reported to be the only 7 1/4-inch saw with this capacity.

The True Course Guide, located behind the cutting blade, helps guide the saw through the cut, keeps the saw moving straight, and holds the cut open to prevent pinching or binding. The device is said to allow easier sawing and to reduce wear and tear on the saw motor and blade.

An improved telescoping guard with a large safety grip permits safe, easier pocket cuts. The heavy-duty saw cuts 2 1/8 inches at 45 degrees and 2 1/2 inches at 90 degrees.

For further information write to the John Oster Mfg. Co., 5055 N. Lydell Ave., Milwaukee 17, Wis., or use the Request Card at page 18. Circle No. 17.

## Cut Paving Costs with Maginniss Side Form Vibrators



Maginniss Vibrating Attachment at work on the Ohio Turnpike. Note vibrated concrete near side forms.

Fifteen Maginniss side form vibrator attachments are now in use by paving contractors on the Ohio Turnpike.

Mounted on Blaw-Knox and Jaeger spreaders and finishers as well as Heltzel telescoping finishers, these vibrators are reducing paving costs—increasing production efficiency every day!

The Maginniss side form vibrator attachment, easily mounted on machines from 12 to 24 feet wide, consists of 2 Hi-lectric, 180 cycle motor-in-head vibrators spring mounted on a shaft and hanger. Position of the vibrator heads, which ride completely submerged in the concrete for maximum vibrating efficiency, is controlled by a hand lever. There are no cumbersome flexible shafts or external drive units.

Powered by a 120 volt, 180 cycle gasoline engine-driven generator mounted on the spreader or finisher, the vibrators produce up to 10,500 VPM—can be mounted as much as fifteen inches in from the side forms and still vibrate concrete effectively at the forms, leaving it free from honeycomb.

The Maginniss side form vibrator attachment eliminates the need for hand labor—cuts costs—produces better paving. Ask your Maginniss distributor for all the facts. You'll find him listed in the Yellow Pages.



Actual photo showing honeycomb left in slab before Maginniss attachment was installed.



Photo of slab on same job showing dense, sound concrete consistently produced by Maginniss Side Form Vibrators.



AA-1708

**MAGINNISS**  
POWER TOOL COMPANY  
154 DISTL AVENUE • MANSFIELD, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 336

The new Madsen Hot Rod 5,000-pound batch asphalt plant.



### Batch-type asphalt plant available in three sizes

■ A "streamlined" portable batch-type asphalt plant designed specifically for the needs of medium and large contractors is announced by Madsen Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corp. Known as the Madsen Model 391 Hot Rod, it is available in models with capacities of 3,000, 4,000, and 5,000 pounds per batch.

According to the manufacturer, the Hot Rod plant incorporates many engineering features never before offered in an asphalt-mixing plant. One of the most important features is the fully-enclosed double-reduction gear box that goes right into the mixer shafts, eliminating the exposed mixer timing gears and the pressure injection pump motor. It is said that this device is the most practical method of accomplishing the huge reduction from diesel-engine or electric-motor speed down to mixer shaft speed in a simple, free-running, dust-tight, well lubricated manner.

The mixer weigh-box assembly reportedly has many features providing for more exacting mix specifications,

faster production, and reduced servicing and maintenance costs. The operator platform is located on the end of the plant—away from dust, fumes, and heat. Asphalt and aggregate scales and all controls are conveniently located. The Madsen Model 440 twin-shaft pug mill mixer is used in the Hot Rod. An added refinement is a new patented rotary distribution bar. This combination, it is said, injects the asphalt into the mill more quickly and cuts it off sharply to give the user improved mixing and reduced mixing time.

The Madsen Hot Rod is designed to utilize a Symons 42 or 48-inch-wide x 10, 12 or 14-foot-long screen to take care of the 3,000, 4,000 or 5,000-pound-capacity mixer. A dust collector, aggregate dryer, asphalt tanks, and other auxiliary equipment is available for use with the new plant.

For further information write to Madsen Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., P. O. Box 38, La Mirada, Calif., or use the Request Card at page 18. Circle No. 122.

clearance?

the  
**ECONMOBILE**  
600 LOADER has it!



The ECONMOBILE is the only loader that can lift as high as 22' (with auxiliary tower) and still get under an 8' clearance. That means the ECONMOBILE can work both inside and outside a building, and can easily get under most aerial obstructions.

The ECONMOBILE also offers a long reach—up to 6' from wheel to heel of the fork; and it has a 90% use factor with a wide range of attachments.

The ECONMOBILE saves on every job. One contractor reported he cut labor costs by \$368 a day.

ECONMOBILE  
REG. U.S. PAT. OFF.

write, wire  
or call

**AMERICAN ROAD EQUIPMENT COMPANY**  
4310 North 28th Street Omaha, Nebraska  
Phone PLeasant 2575

For more facts, use Reader-Reply Card opposite page 18 and circle No. 337

CONTRACTORS AND ENGINEERS

## distributor doings

### Buffalo-Springfield names two new dealers

Two new distributors, both in South Dakota, have been appointed by the Buffalo-Springfield Roller Co., Springfield, Ohio. Covering those parts of the state west of the Missouri River is West River Equipment Co., 417 Pine St., Rapid City. S. S. Roberts is president of the firm.

Foster-Bell Co., 1001 East 14th St., Sioux Falls, will cover the eastern section of the state and three counties west of the Missouri River. Complete sales and service facilities are maintained at both the main office in Sioux Falls and at a branch in Aberdeen.

Both dealers will handle the complete line of Buffalo-Springfield road roller and compaction equipment.

### New dealership takes over for Koehring in Texas

The entire Koehring line of heavy-duty construction machinery is being handled in southeastern Texas by the Cactus Equipment Co., Houston. Cactus will serve not only as a distributor for Koehring, but also for equipment manufactured by three Koehring subsidiaries, Parsons Co., C. S. Johnson Co., and Kwik-Mix Co.

Under the management of S. A. Witte, and located at 2310-2312 Calhoun, Houston, the firm succeeds F. S. Ray Co., as the Koehring representative in the area.

### B-E names distributors

Two new distributors of its full line of excavators and cranes have been appointed by the Bucyrus-Erie Co., South Milwaukee, Wis. Road Machinery Co., 716 S. Seventh St., Phoenix, will serve the entire state of Arizona.

Western Nevada and northeastern California will be covered by Tractor Equipment Co., Reno, Nev. The new distributor maintains headquarters at 1525 E. Fourth St., Reno.

### Brunner & Lay appoints two new distributors

The Brunner & Lay Rock Bit Corp. of Philadelphia, Pa., has designated two new dealers as distributors of its Rok Bits, drill rods, and pneumatic tool accessories.

Terry Tools, 2266 Shafter, San Francisco, Calif., will represent the firm in northern California and Nevada. The New England territory will be served by Biondi Bit & Drill Steel Co., Waterbury, Conn.

### Thew names distributor

The Thew Shovel Co., Lorain, Ohio, has appointed the Hein Equipment Co., 238 N. 121st St., Milwaukee, Wis., a distributor of Lorain power cranes and shovels. The new dealer will serve all of Wisconsin and the upper peninsula of Michigan.

### Clark names distributor

The Clark Equipment Co., Benton Harbor, Mich., has appointed Regan Equipment Co., 4916 Jefferson Highway, New Orleans, La., a distributor of the Michigan line of tractor shovels and excavator cranes. The new dealer will cover sixteen Louisiana parishes.

### Buck names new dealers

Two new distributors to handle its line of hoisting machines have been appointed by the Buck Equipment Corp., Cincinnati, Ohio. The city of

Cincinnati will be covered by the Carroll & Edwards Co., from offices in that city.

The Equipment Rental Co., 921 Starrett St., Baltimore, Md., will serve contractors in the Baltimore area.

### Euclid opens new branch

A new factory sales and service branch of the Euclid Division of General Motors Corp., Cleveland, Ohio, has been opened in Minneapolis, Minn. Located at 3305 Republic Avenue, the branch will serve the entire state of Minnesota with the exception

of the Iron Range.

Walter Vranesh has been appointed office manager of the new branch, and W. R. Brown, T. J. Mickelson, and R. J. Schroeder will serve as district representatives.

### Timken names McCoy to division post

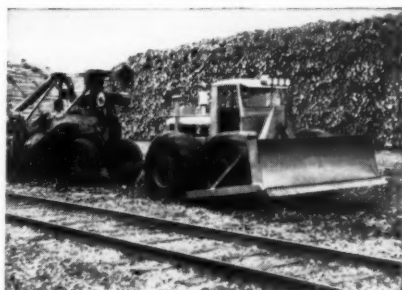
Wyn McCoy has been promoted to the post of sales promotion manager for the industrial division of The Timken Roller Bearing Co.'s Chicago territory. He was formerly district manager of the division.

## Speed and Mobility

get more work done!



Tournatractor takes the shortest route to job... via highway or cross country... cuts hours from job-to-job moves.



208 hp Tournatractor with PCU on rear can be hooked up to pull scrapers, rotozers, and rollers.



Rubber tires do not damage rails or ties... unit can switch up to 10 fully-loaded railroad cars at once.

Whenever your application involves scattered job assignments, Tournatractor's 19 mph forward speed and extreme maneuverability cuts moving costs and reduces the non-pay hours of moving time. Big, low-pressure tires let you drive Tournatractor anywhere. For long moves, you save time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

#### Speed on the job

Tournatractor pulls, dozes, pushes at working speeds 2 to 3 times faster than crawler tractors. You have 3.69 mph in second gear, 8.38 mph in third, compared to crawler speeds of around 2 mph in second, and 3 mph in third. Tournatractor travel speed of 19.23 mph compares to the crawlers' top ranges of 4 to 6 mph. You change gears instantly...waste no time shifting.

#### 8 mph reverse speed

High reverse speeds give a very important time-saving advantage to tractor-on-rubber. Nearly 50% of your working cycle on dozing or pushing jobs is usually spent backing up. Tournatractor's reverse speed cuts crawler backing up time by almost 25 to 50%. Crawler highs in reverse range from 3.1 to 6.2 mph. Tournatractor high in reverse is 8 mph.

#### Instant shifting

Constant-mesh transmission aids high-speed performance by eliminating delays in changing gears...saving vital momentum...gives you any gear ratio instantly. Tournatractor works in higher gear ratios because there is no loss of momentum for shifting. Torque converter increases this advantage by giving you wide automatic over-lapping of gear ratios, without depending on operator to jockey levers to get the most effective ratio of power and speed to load.

#### Ample flotation and traction

2' wide tires stay on top of soft ground instead of digging in. Lugs bite into underfooting to give traction. Tire pressures as low as 20 lbs. absorb shock. Rolling action compacts loose materials far more effectively than crawlers.

#### Lower maintenance

There are 4 easy-rolling-wheel-assemblies as compared to more than 500 wearing parts in standard track-assemblies. This means less maintenance. Dollar-wise this reduction in maintenance time can mean a saving of \$3 per hour in operating expenses.

#### Easier to operate

Fingertip electric controls work at the flick of a switch. Steering, raising and lowering the blade, and operating the power-control-unit are all handled by buttons on dashboard. There are no levers, wheels, or other manual controls to handle. Big, low-pressure tires greatly reduce jars and jolts, stress and strain, on both operator and machine.

#### Interchangeable equipment

Adding to Tournatractor's versatility are a number of interchangeable attachments... Bulldozer, Angledozer, Root Rake, Snow Plow. This versatile tractor can also be equipped with a Push-Block, Logging-Winch or Tree-Pusher for additional applications. Drawbar and PCU are available for hauled equipment. Electric-control, open-top scrapers are also available for use with Tournatractors.

Find out for yourself how Tournatractor's go-anywhere mobility and 19 mph speeds can help you get more work done. Compare this rubber-tired tractor alongside your present crawlers. Write or call for a demonstration.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-926-G-B



**LeTourneau-WESTINGHOUSE Company**  
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 338



## Heating-planing unit

■ The Monatco Mfg. Corp. Heater-Planer for leveling the surface of asphalt roads, highways, runways, and streets is described in a folder. According to the specification chart, the unit levels to widths of 78 inches. It is reported that there is no smoke while the machine is working.

To obtain the folder write to Monatco Mfg. Corp., 1401 Woodland, Kansas City, Mo., or use the Request Card at page 18. Circle No. 54.

## Short-haul conveyor

■ The Barber-Greene Model 375 transfer conveyor for short hauls is briefly described in a bulletin from the company. Job photos show the

conveyor transporting sand, gravel, rock, aggregate, and other materials. The bulletin states that the conveyors are available in lengths of 8 feet and up in one-foot increments, and in 18, 24, and 30-inch belt widths.

To obtain this bulletin write to Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 37.

## Gahagan Dredging news

Andrew J. Johnson has joined Gahagan Dredging Corp., New York, N. Y., as controller. He was formerly assistant controller, U. S. Post Office Department, Washington, D. C. Johnson served as controller of West Virginia Coal & Coke Co., before entering the government service.



*— Here come the jets!*

**Get set for them with Flintkote Paving Products!**

Jets... jets... jets! They're in service... in production... on order. And airfields... both commercial and military... must be tailor-made now to handle them.

FLINTKOTE'S FLINTBINDER\* C-2 was especially designed for critical areas of airfields serving jet-powered aircraft. It is a specially compounded hot-mix, tar-rubber binder for jet-fuel-resistant, flexible pavement.

Used as a surface course over asphaltic or portland cement concrete, Flintbinder C-2 makes it possible for runways, taxiways and aprons to stand up successfully under the spillage of jet fuels.

And to prevent jet traffic from deteriorating joints in concrete pavement, seal these joints with the jet-fuel-resistant, hot compound... FLINTSEAL\* JFR. This flexible, resilient joint sealer adheres to concrete and remains extensible and compressible at high and low temperatures. Keeps out moisture and incompressible debris. (Meets Fed. Spec. SS-S-00167.)

TACKSEAL† is Flintkote's new rubber-bearing, hot-applied coal-tar base material for use as a tack coat and as a surface sealer. Also available is FLINTAR‡ coal-tar pitch emulsion (meets Fed. Spec. R-P-00355). Both are resistant to oil, grease, engine cleaning compounds and, of course, jet fuel.

**Write for technical data and literature.**

**FLINTKOTE**



THE FLINTKOTE COMPANY, INDUSTRIAL PRODUCTS DIVISION  
30 Rockefeller Plaza, New York 20, N. Y.

BOSTON • CHICAGO HEIGHTS • DETROIT • LOS ANGELES • NEW ORLEANS • PHILADELPHIA  
In Toronto, Ontario: THE FLINTKOTE COMPANY OF CANADA, LTD.  
In London, England: INDUSTRIAL ASPHALTS COMPANY, LTD.

\* REG. U. S. PAT. OFF.

† A TRADEMARK OF THE FLINTKOTE COMPANY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 339

One of the material-handling rigs made by the Ottawa Steel Division of the L. A. Young Spring & Wire Corp.



## Material-handling rig for supply-yard use

■ The Ottawa Steel Division of L. A. Young Spring & Wire Corp. has introduced a new Tracto-Lift especially designed for outdoor material-handling. Large pneumatic tires on the front drive axle are said to provide good traction and floatation for the economical handling of all materials.

The unit is available in three basic models: the TL-50 (5,000-pound capacity), the TL-60 (6,000-pound capacity), and the TL-70 (7,000-pound capacity).

This outdoor fork-lift has such features as shuttle gear transmission with control lever on steering column, providing six speeds forward and six speeds reverse; power steering; an hour meter; lights; ignition key start-

ing; and horn. This unit is available with pallet forks of various lengths, as well as concrete-block tine forks. A side shifter load carriage for use with either pallet or tine forks is optional equipment. The standard load carriage is 48 inches wide, but a 64-inch carriage is also available.

A number of load-carrying devices are available to fit the standard load carriage for clamping or rotating loads. Boom attachments and bucket attachments are also available as fork replacements.

For further information write to the Ottawa Steel Division, L. A. Young Spring & Wire Corp., 5th and Main, Ottawa, Kans., or use the Request Card at page 18. Circle No. 12.

## Diesel power units described in catalog

■ Two Caterpillar engines, the Models D337 and D326, are featured in a catalog from the company. The turbo-charged D337, which powers the DW20 and DW21 wheel-type tractors, is similar in design to the D326, which powers the DW15 wheel-type tractor. Parts of the engines pictured are the adjustment-free valve system, fuel system, exhaust-driven turbocharger, and the lube-oil system. A cutaway of the D337 points out 28 working parts of the engine. Complete specifications are given on both models.

To obtain Form No. 31914 write to Caterpillar Tractor Co., Peoria, Ill.,

or use the Request Card at page 18. Circle No. 33.

## GMC names executive for truck division

The Truck and Coach Division of General Motors Corp., Pontiac, Mich., has named W. L. Vande Water to the position of executive assistant to the general manager in charge of dealer relations.

In the newly created position, Vande Water will work closely with sales personnel and on development programs with distributors.



**ROLATAPE**  
**MEASURING WHEELS**  
**FOR EFFICIENT, TIME-SAVING**  
**ECONOMICAL MEASURING!**

Actual working conditions prove that measuring time can be cut to a fraction with a Rolatape Measuring Wheel.

**ROLATAPE MODEL #400**—Widely used by Telephone Companies, Utilities, Paving Contractors, Land Appraisers, etc. Its four-foot circumference measuring wheel gives accurate measurements even on fairly rough terrain. Constant logging information in plain view... Can be operated from car at slow speed... Light weight and sturdy... calibrated wheel measures from zero up to nearly nineteen miles... Counter can be reset at any distance.

**ROLATAPE MODEL #200**—For interior and outside use. Widely used by Real Estate Men, Appraisers, Roofers, Traffic Officers, etc. A built-in totalizer records measured distance in feet and inches. Measures line-to-line and wall-to-wall... Vertical measurements are easy to make... simple to operate. Extend handle, guide... Rolatape measures and records.

**ROLATAPE MODEL #600**—For cross-country and acreage measurements, or measuring conduit distances where rough terrain ordinarily creates traction problems. Can be mounted from rear of jeep, tractor, or any slow moving vehicle. Special hitch available. Measures up to nearly nineteen miles. Records as it measures.

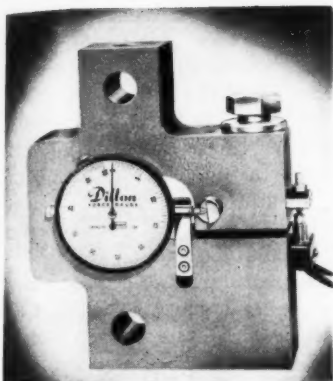
**FOR ROLATAPE INFORMATION, SEE YOUR DEALER, DISTRIBUTOR**  
**OR WRITE TO**

**ROLATAPE INC.**

FACTORY: 1741 FOURTEENTH STREET, SANTA MONICA, CALIF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 340

CONTRACTORS AND ENGINEERS



The tensile version of the Dillon force gage. The new instrument will measure mechanical forces of up to 50,000 pounds.

### New gage measures 50,000-pound forces

■ An instrument capable of measuring mechanical forces of up to 50,000 pounds is available from W. C. Dillon & Co., Inc. The instrument is available for either compressive or tensile tests and has a warranted accuracy of within 1 per cent of the indicated reading.

The new 50,000-pound Dillon force gage weighs 30 pounds in the compression model and 37 pounds in the tensile model. It is a compact unit and is recommended for use where space is at a premium.

The tensile version includes eyes for the insertion of clevises. The compression model has a recessed cup on top for seating a free-riding, hardened steel ball. The rotating action of this ball under pressure insures true vertical thrust against the gage, the manufacturer states.

For further information write to W. C. Dillon & Co., Inc., 14620 Keswick St., Van Nuys, Calif., or use the Request Card at page 18. Circle No. 88.

### Improved wheel block holds heavy vehicles

■ An improved safety device marketed by the Calumet Steel Castings Corp. is the WB2H Standard Safety wheel block.

The WB2H wheel block is designed with rounded edges, stiffening ribs, and supporting members, as well as integrally-cast gripper teeth. The approximate over-all dimensions are 9 x 10 x 10 inches. Provision is made for chaining the block to dock or vehicle.

For further information write to the Calumet Steel Castings Corp., 1610 Summer St., Hammond, Ind., or use the Request Card at page 18. Circle No. 151.



### Brush cutter converts to chain saw or drill

■ A new brush cutter for clearing heavy undergrowth and overhanging branches is announced by McCulloch Motors Corp. The unit is said to be especially useful to construction workers for road and right-of-way clearing.

The cutter has a 6-foot reach, and a 10-inch circular saw blade. The complete unit, including engine, weighs 28 pounds and can be operated by one man. With accessories, it can be converted into a chain saw or to



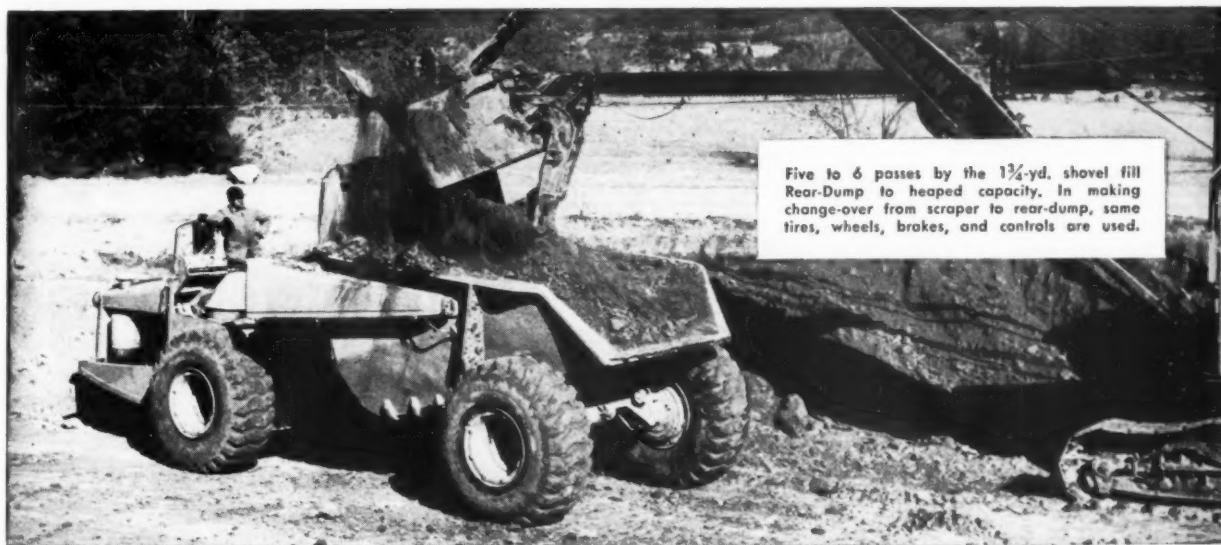
McCulloch brush cutter has a 6-foot reach and a 10-inch circular saw blade.

operate as an all-purpose drill.

For further information write to McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif., or use the Request Card at page 18. Circle No. 96.

### Heltzel appointment

Eleven western states constitute the territory of Kenneth Simpson, the new district representative of Heltzel Steel Form & Iron Co., and its subsidiary, Flexible Road Joint Machine Co., both of Warren, Ohio. His headquarters is in Redondo Beach, Calif.



Five to 6 passes by the 1 1/4-yd. shovel fill Rear-Dump to heaped capacity. In making change-over from scraper to rear-dump, same tires, wheels, brakes, and controls are used.

## Alabama contractor shows how to get "double value" from each dollar of equipment investment

"Interchangeability" has a powerful meaning to Clyde O. Mitchell, Birmingham. It's the way he assures himself "double value" from his versatile C Tournapulls.

For dirtmoving, Mitchell hitches 14-yd. scrapers behind his 2-wheel "C" prime-movers. Whenever he encounters shovel rock, he switches scraper bodies for rear-dumps to handle this problem. The ability to switch to rear-dumps eliminates added ownership or rental expense of trucks, reduces maintenance cost as well as equipment and parts inventory, and permits operation under weather and haul road conditions that would shut down truck operation.

#### Double duty means added profits

Mitchell has made extra profits twice so far on important jobs because of this quick-change feature of his C Tournapulls.

First double-duty assignment was a state highway improvement job at Decatur, Alabama. On this job, the scrapers handled 800,000 yds. of dirt, while Rear-Dumps moved 100,000 yds. of rock.

Recently he relocated and straightened 4.1 miles of State Highway 431 between Attalla and Boaz. Here, of the 486,000 cu. yds. of material to be moved, about 16% was rock, 75% chert, and 9% clay. The dirt-

moving was handled by two C Tournapulls with Scraper, three 18-yd. tractor-drawn FP scrapers, and three self-propelled scrapers of another make. The Tournapulls were then equipped with Rear-Dumps to haul rock... about 78,000 yards.

#### 4200' cycle every 6 minutes

Time studies show the Tournapull Rear-Dumps are real producers. With wide, easily entered bodies, they were loaded with 10 pay yards by a 1 1/4-yd. Lorain shovel in an average of 1 minute, 40 seconds. Working 4200' cycles, each round-trip took only 6 minutes. Haul and return speeds averaged 12 mph. Hourly output for the 2 machines was 180 pay yards per 55-minute hour.

#### More speed on long hauls

This kind of production and Tournapull interchangeability highly pleases the owners. Says Supt. G. M. Wakefield: "I like the C Tournapull prime-mover. It's got a good scraper and rear-dump. It will stand up against any dirtmover."

Adds operator C. L. Moore: "The Tournapull can turn everywhere, and it's got more speed on long hauls. It's simple to understand... easier to operate than other rigs."

Figure out for yourself on the basis of cost alone the extra value of Tour-

napull interchangeability. An additional haul unit costs about 25% of the total initial price of prime-mover and original haul-unit combination. Interchangeable haul-units can be purchased at any time.

Find out how this double-duty equipment can give you double earning power for every dollar of investment. For more facts and owner-verified case histories, write or phone today.



Dumping on the run, Rear-Dump builds sub-grade in cut where rock has been removed. Average dumping time was about 20 seconds. Electric controls respond instantly for steering and controlled dumping.

Tournapull—Trademark Reg. U.S. Pat. Off. R-801-H-14

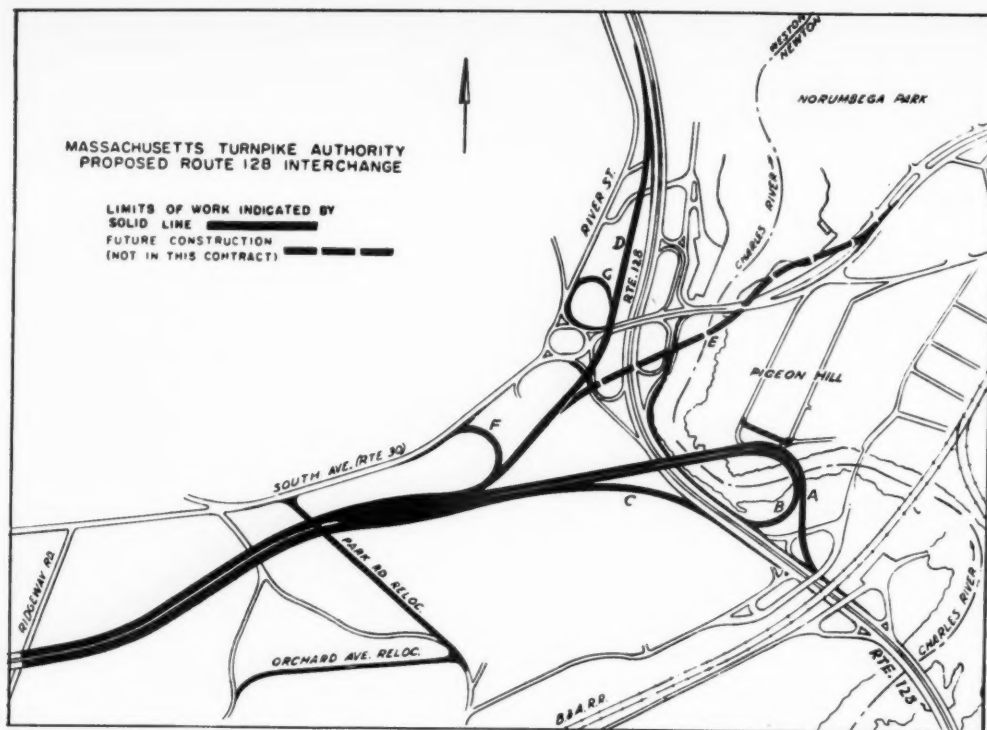


**LeTourneau-WESTINGHOUSE Company**  
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 341





## Unique schedule halves time

## for interchange construction

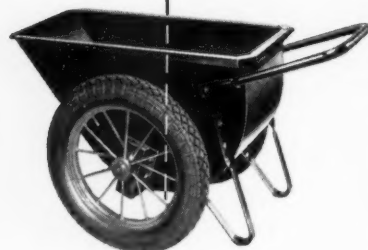
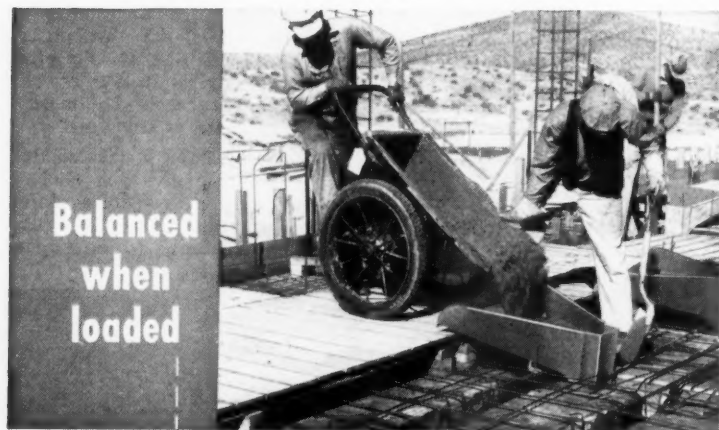
**Design and construction work are carried on at same time;  
unfinished plans issued, approved to speed steel delivery**

By carrying out design and construction work concurrently, the Massachusetts Turnpike Authority is completing a two or three-year job in a little over a year. The work is being done on the \$6,000,000 interchange linking the turnpike with Route 128, a limited-access highway near Weston, which arcs around Boston from north to south.

Originally, the project was to have included two viaducts totaling 1,700 feet in length, 13 additional bridges, and structures that would protect existing aqueducts, highways, and utilities. Clarkson Engineering Co. of Boston was called in on the job

## GAR-BRO CONCRETE CARTS

**INSURE Full Capacity LOADS**



**HANDLES 30% MORE** load with half the effort.

**LIGHTWEIGHT**— $\frac{1}{4}$  to  $\frac{1}{2}$  lighter than ordinary carts.

**ROCKER DUMP** type carts are available for handling dry concrete.

**HIGH TRAY** permits hauling lumber, forms and other materials.

**THREE MODELS:** Narrow 30" width, 6 cu. ft. cart for easy handling and narrow runways. Standard 35" width, 6 to 8 cu. ft. carts. See your Gar-Bro dealer.

GAR-BRO MANUFACTURING CO • Los Angeles, Calif. • Peoria, Ill.  
General Offices: 2415 E. Washington Blvd., Los Angeles 21, California

**GAR-BRO** the world's most complete line of  
**Concrete Handling Equipment**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 342

Ask your dealer  
for the  
Gar-Bro Manual...



## DRILL FOR FAST EXCAVATION

for  
FOUNDATIONS  
CAISSON PIERS  
BELLED FOOTINGS  
CESSPOOLS  
WATER WELLS  
OIL DRILLING SITES



World's fastest method of boring in all types of soil

## CALWELD BUCKET TYPE EARTH DRILLS

Here's how Calweld Earth Drills perform on the job:

- Four pier holes (24" dia. by 60') with 72" belled footings in one day
- Thirty-three caisson pier holes (16" dia. by 20') with 30" bells in 10 hours
- Two belled caissons (24" dia. by 21') with 72" bells in one hour
- One cesspool per hour (48" dia. by 25')

Drilling, hoisting and dumping operations are performed mechanically. Highly mobile and maneuverable Calweld Earth Drills are now considered essential equipment by many contractors. Get the facts; write today for literature and on-the-job field reports.

CALWELD, INC. • 7222 E. SLAUSON AVE. • LOS ANGELES, CALIFORNIA

**DRILLS 16"—84" HOLES 200 FEET DEEP**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 343

CONTRACTORS AND ENGINEERS

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on December 5, 1955, advised of the general design for the interchange, and told that traffic had to be moving on the project by the end of November, 1956. Clarkeson set a goal of completing one-third of the plans by January 15, one-third by February 15, and one-third by March 15.

After design had been completed, construction of one of the viaducts was deleted from the plans.

#### Shortage threatens schedule

A shortage of steel threatened to interfere with Clarkeson's schedule since the project calls for more than 4,000 tons of various grades. Under ordinary conditions, delivery would have taken from 12 to 18 months from the time detailed orders were placed, but the steel company indicated that shipments could be accelerated if Clarkeson could complete the steel plans quickly.

As early as January 6, sufficient design had been completed and approximate quantity estimates prepared to permit B. Perini & Sons, Inc., Framingham, Mass., to offer unit prices. On January 30, less than two months after the approval of the design and much less than two months after the surveys were begun for design and borings, Perini started work.

With priority given to steel plans, Clarkeson not only met the deadline,

but he bettered it by delivering 80 per cent of the data for steel requirements by January 15, and the remainder by February 15. Information for steel-rolling schedules, shop drawings, and full fabrication, when completed, involved Howard, Needles, Tammen & Bergendoff, New York, N. Y., consultants to the authority, and the American Bridge Division of United States Steel Corp., in addition to the Massachusetts Turnpike Authority, Clarkeson, and Perini.

#### Plans released before completion

Because of the time limit, Clarkeson had to release drawings before they were completed so that materials could be ordered, approvals obtained, and work could be started. Even after they had been issued to the contractor, many drawings had to undergo revisions as more complete and detailed field information was obtained, while other issued drawings had to be revised to permit the addition of items not required for the earlier construction phases.

To minimize any possible chance of error, a strict control system was established for the engineering firm, the contractor, the project manager, the resident engineer, the turnpike authority, and the general consultants. While the full effect of this con-

(Concluded on next page)

## Symons Forms for Battered Walls

Battered walls are constructed similar to vertical walls, the only difference being a variation in the lengths. Ties are placed when inside form is erected . . . outside wall is locked to ties with the same connecting bolts and wedges that bind panels together.

Symons Service includes the details of a forming job from start to finish. Form layouts and job cost sheets are provided upon request without charge or obligation. Attach this advertisement to your letterhead for complete information on Symons Forms and accessories. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. G-6, Chicago 39, Illinois.

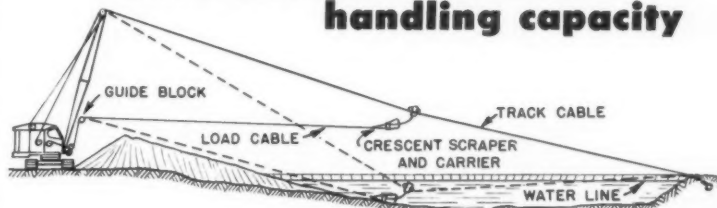
Water Reservoir, Omaha, Nebraska,  
De Buse Bros., Form Erectors



For more facts, use Reader-Reply Card opposite page 18 and circle No. 345

## the SAUERMAN METHOD...extends the reach of your crane

## the CRESCENT SCRAPER...increases its handling capacity



Drawing shows crane using Crescent Scraper and carrier with a track cable. This arrangement increases effective digging range and permits gravity return to the excavation for a faster operating cycle. Maximum operating span is governed only by amount of cable that may be reeved on the drag drum.

### Use This Fast, Economical Method For:

Cleaning Ponds  
Trenching Streams  
Sludge Removal

Cleaning Under Bridges  
Building Reservoirs  
Beach Construction

Any crane can handle a Crescent Scraper larger than its regular drag-line bucket. Smaller units can increase their capacity about 50%. Large cranes can usually double their capacity. When the boom is supported by a strut or outrigger, a Crescent of still greater size can be used. Arrangements of this type have increased rated crane capacity as much as 4 to 1.

The Crescent hauls its load on the ground and the load is automatically deposited when the bucket is raised. Only the empty scraper bucket is lifted by the crane.

When a crane is equipped with a track cable, Crescent and carrier, it can reach farther, dig deeper under water or from soft areas without the nuisance of mats. Anchorage for the track cable may be fixed—or movable to provide easy shifting to a new line of operation. A tractor makes an excellent mobile anchorage.

Although the track cable method is best for increasing your machine's range, the Crescent can also be cast like your regular bucket.

Get the facts on how much the capacity of your crane can be increased. Give us the make, model and boom length. Ask for Field Report 228 and Catalog J. Catalog T tells how to use Crescents with tractors.

**Important to Users of Blocks and Fittings:** Get the new Sauerman bulletins showing the complete line of Wire Rope Fittings and Duralite Sheaves available from stock. Ask for Bulletins 164 and 165.



This Indiana contractor used the track cable method with a 1 1/4-cu. yd. Crescent Scraper to trench across a river. After the water main was placed, the scraper backfilled the trench.



Boom support enabled this crane to use a larger Crescent. After a sub-grade of coral was placed, the 4-yd. scraper was reversed and used to grade the beach. Barge-mounted winch served as anchorage for track cable and supplied power to scraper on grading operations.

**SAUERMAN BROS., INC.** 616 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Duralite Blocks

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#### MODEL MSO-D

Multiple axle drop bed semi. capacities 35 through 75 tons. Drop deck or flat bed.



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Tandem axle tilt trailer (tow type), capacities 13 through 20 tons.



#### DUMP TRAILERS

Single or tandem axle models. Standard capacities 8 through 15 yards.

MANY OTHER  
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## NEW MODEL GPRY

Tandem Axle Removable Gooseneck Trailer. Full width tubular cambered axles. Available as a beam trailer, flat or drop platform trailer, or as shown with removable side platforms with sliding outriggers. Also available with triple or trunnion axles. Standard capacities 15 through 60 tons. Write for complete information.

"TRANSPORTATION ENGINEERING A SPECIALTY"



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(Continued from previous page)

trol system cannot be measured until traffic is actually moving, it has speeded design, making it possible to meet the deadline.

In order to avoid any possible difficulties in the procurement of right-of-ways, all layout drawings for procurement were completed by mid-January, well in advance of the completion of the design drawings.

#### Aqueducts are bridged

Complicating the design was the fact that two Metropolitan District Commission aqueducts, which supply Boston and surrounding communities with their total water supply, run through the entire area. Since they could not be moved economically, they

had to be bridged at every point at which the turnpike or its ramps or other roadways crossed them.

The work also necessitated the relocation of a section of the banks of the Charles River and the relocation of more than 2,000 feet of fast-flowing brook.

Those designs which the contractor would need in August or September, Clarkeson planned to finish by June or July. Yet, as early as February 14, the engineering firm was able to turn the project over to the direct supervision of the project engineer.

Six ramps to handle the heavy flow of traffic were built. Ramp A will take vehicles coming north on Route 128 onto the turnpike, and Ramp B, paralleling Ramp A, leads from the turnpike to Route 128 for northbound

or Commonwealth Avenue traffic to Boston. Southbound traffic from the turnpike to Route 128 will follow Ramp C, while Ramp D takes vehicles traveling south on Route 128 onto the turnpike. A minor ramp, F, will take vehicles from South Avenue, Route 30 in Weston, to the turnpike to travel west, and Ramp G will run from Commonwealth Avenue to the turnpike. An additional major ramp had been planned to take vehicles from Commonwealth Avenue onto the turnpike, but was later deleted from the project although the design had been completed.

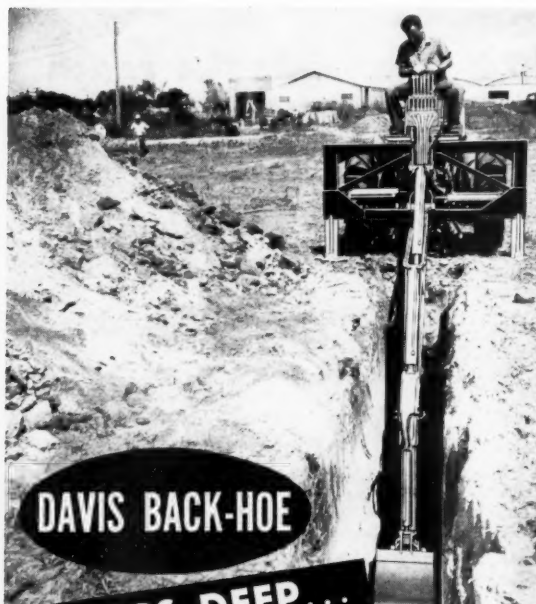
This \$6 million interchange, located 15 miles east of Boston, will become one of the most important interchanges in the state's highway network by linking the 123-mile Massa-

chusetts Turnpike with Route 128. The turnpike is expected to carry up to 18,000 vehicles per day by 1960, and Route 128 now carries as many as 40,000 a day. In the past three years, over \$100,000,000 in new industries have sprung up along Route 128, and other industrial developments are expected to locate along the route.

#### Personnel

The interchange project was under the direct supervision of John Clarkeson of Clarkeson Engineering Co. Structural design was handled by William A. Henderson and Samuel A. Wigon; drainage and utilities design by Stewart P. McAfee and Robert S. Restall. Thomas A. McManus was in charge of highway design. Project engineer is Robert E. York, and Dwight H. Moore is resident engineer for construction. Chairman of the Massachusetts Turnpike Commission is William F. Callahan.

THE END



**DAVIS BACK-HOE**

**DIGS DEEP...**

**DUMPS FAR TO THE SIDE**

#### LETS YOU SEE ALL THE WAY!

The Davis Back-hoe takes the guesswork out of digging... stops the worry of cutting through gas, sewer, or water lines. You can dig 13' deep, and still see exactly where the bucket bites in. And you can dump all the excess to just one side, leaving plenty of working space between the pile and the hole to eliminate back-dropping. That's because the Davis will dump...as well as dig...at right angles to the tractor. It is designed for greater utility...comfort and visibility. Compare in quality, versatility, and price with any on the market. IT OUTPERFORMS THEM ALL!

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You can't buy a better loader than Davis. You get maximum strength, maneuverability, visibility, and versatility, because of the streamlined, functional design and many different attachments. You can attach or detach the Davis Back-hoe from the Loader in less than 5 minutes. Ask about the Davis Combination Deal!

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#### AWS releases new edition of bridge specifications

The fifth edition of bridge specifications has been released by the American Welding Society. In addition to material carried over from the fourth edition, "Standard Specifications for Welded Highway and Railway Bridges" contains information on steel suited to welded bridge construction, design and workmanship requirements for submerged arc welding, and typical joint designs for various thicknesses and various types of joint.

Compiled by the AWS Conference Committee on Welded Bridges, the book contains charts and diagrams to illustrate the text.

Priced at \$1.50, the book may be obtained from the American Welding Society, 33 W. 39th St., New York 18, N. Y.



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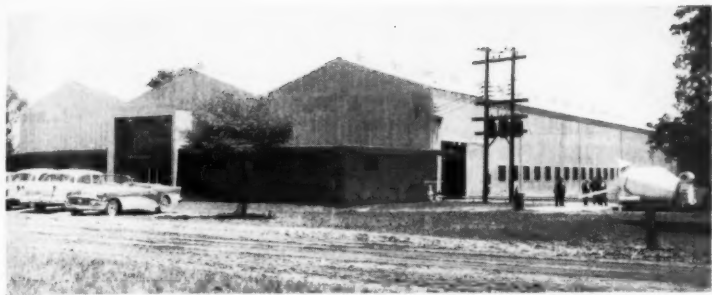
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**CONTRACTORS AND ENGINEERS**



### T. L. Smith opens new mixer plant in South

Full-scale production of concrete mixers got under way at the new Lufkin, Texas, plant of the T. L. Smith Co., little more than a month ago. During the May 14-16 opening ceremonies, businessmen and more than 250 representatives of the concrete-construction industry in the Southwest toured the modern 54,000 square-foot plant, which was designed especially for the production of transit mixers.

Said to be the first mixer plant in the South, the new facility consists of a modern brick office section and a steel plant building. It is located on a 20-acre site near the north edge of the city of Lufkin in the pine-forest region of east Texas.

The factory building has three 50-foot-wide 150-foot-long bays, each equipped with a 10-ton crane operating on rails. The rails run the full length of the bay and extend over the railroad siding at the rear of the building and continue another 60 feet into the storage yard beyond. Shop equipment includes the most modern metal-working and handling machines for shearing, rolling, cutting, welding and processing the raw materials.

At first, the output of the plant will be confined to a single truck-mixer model, but production will be expanded later to include all of the models commonly used in the South and Southwest. Portable mixers and the large concrete-plant equipment may also be added to the line produced at this plant.

Starting with a nucleus of a few trained personnel transferred from the main plant at Milwaukee, Wis., the plant staff will be expanded to about 100 people through the training of local employees. The plant manager is Marvin Kreuter.

The Smith firm, which has Robert W. Smith as president, patented and started manufacturing the first tilting concrete rotary mixer in 1900. By 1937, the company had patents for the first high-discharge truck mixer, known at the time as "Smith's Folly".

### Line of V-belts

■ The Worthington line of V-belts is featured in a catalog from the company. Some of the types pictured and described are the open-end, steel cable, light-duty, and compass V-belts.

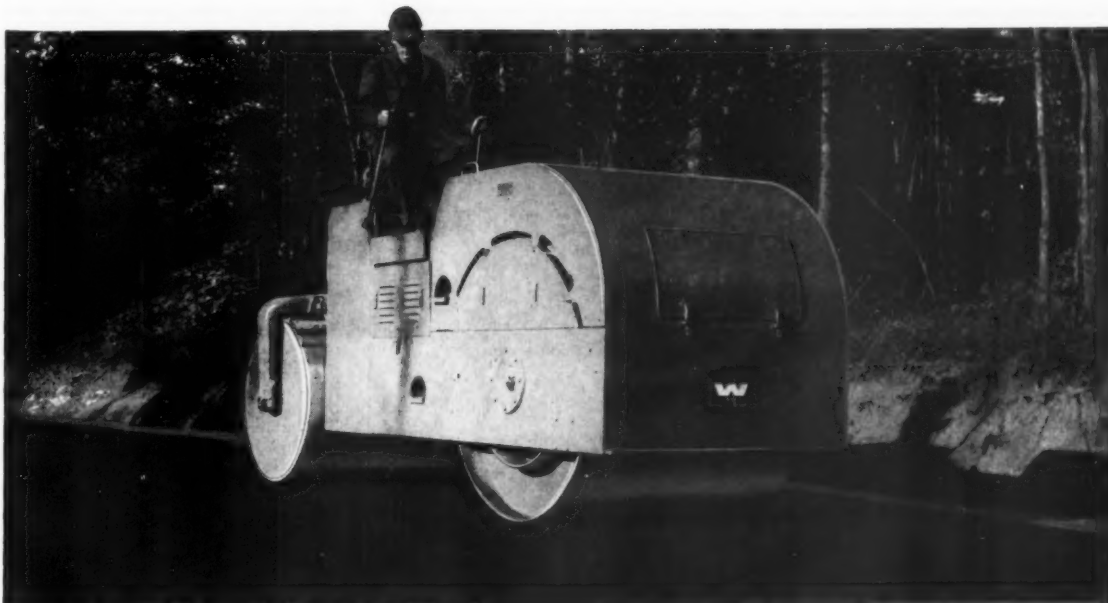
To obtain Catalog V-1400-B20-P write to Worthington Corp., Mechanical Power Transmission Division, Oil City, Pa., or use the Request Card at page 18. Circle No. 63.

The new T. L. Smith plant at Lufkin, Texas, combines 9,000 square feet of modern office space in the brick section at front with 45,000 feet of manufacturing space. A transit mixer is demonstrated at right for visitors.



# NOW

## HUBER-WARCO TANDEM'S OFFER torque converter 2-speed transmission



Two new important features added to Huber-Warco medium and large sized tandem rollers are: a torque converter and a two-speed transmission.

The torque converter offers all of the advantages of a fluid coupling, with these important plus features: (a) available power is doubled, (b) the roller maintains approximate rolling speed regardless of grades encountered, and (c) fuel consumption is reduced.

Advantages of the two-speed transmission are: (a) at slow rolling speeds, the use of low gear maintains sufficient RPMs at tailshaft to keep governor effective, (b) makes correct gear ratio available to meet any work load or desired rolling speed, thus reducing strain on converter and engine, and (c) allows the engine to maintain sufficient RPMs to provide

hydraulic pressure for fast steering at low rolling speeds.

Other important Huber-Warco features include: the exclusive guide roll assembly that will not "scuff" (factory perfect adjustment for the life of the roller); full hydraulic steering with variable speed adjustment; two braking systems; dual controls; close curb clearance and many other features that make the Huber-Warco tandem line outstanding.

Huber-Warco medium and large sized tandems are gasoline and diesel powered and are available in 5-8, 8-10, 8-12 and 10-14 ton models. A 3-5 ton tandem with water cooled engine and torque converter as standard equipment, is also available.

Write for specifications.

For a demonstration — see your nearest Huber-Warco distributor



## HUBER-WARCO COMPANY

MARION, OHIO, U. S. A.

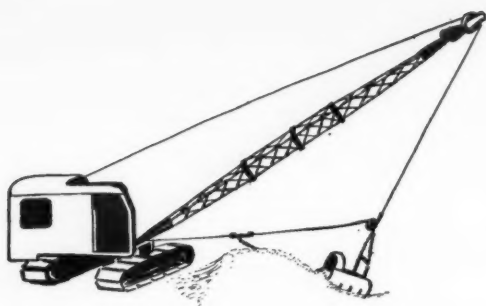
Road Machinery

CABLE ADDRESS: HUBARCO

ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS • GRINDERS

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## Pit operation

**B**ank gravel is a useful and highly varied material. It consists chiefly of sand, pebbles, and cobbles, but may also contain clay, silt, and boulders, mixed in or in accompanying layers or pockets. The gravel proper is the pebbles and cobbles in sizes from 1/4 to 2 inches.

The specifications which gravel must meet to do certain jobs, and the proportions found in deposits, vary widely.

Bank gravels consist mainly of deposits laid down by fast-running streams, often of glacial origin, but they are also formed by waves on the seashore. The quality depends not only on the proportion of sizes but also on the angularity of the particles. Wave-formed gravels are predominantly rounded, glacial ones sub-

angular, and the product of other streams variable.

Talus gravels, formed at the foot of cliffs by falling and sliding pieces of rock, are usually very coarse and angular.

If gravels are not sufficiently angular for their job, and contain oversize stones, they may be run through a crusher which will produce angular fragments.

Fines in bank gravel act as a ce-

ment or binder, holding it together when dry. Gravel without binder becomes too loose for road use in hot, dry weather.

Fines in excess of 8 or 10 per cent may cause a gravel to become sloppy after repeated freezing and thawing when wet. Fines over 15 per cent may cause it to soften under prolonged soaking. Softening is made more likely by a high proportion of fine sand in the mixture, and less likely if thor-

ough compaction precedes the freezing or soaking.

Any gravel will become sloppy if soaked when freshly dug, but if it is of good quality it should drain and firm quite quickly.

Gravels derived from continental glaciers are largely of hard rock. River and mountain glacier gravels are derived from upstream formations, and occasionally include too much shale or other soft rock for some purposes.

There are a number of tests for gravel for either field or laboratory use.

If a specimen is rolled between the fingers, it will separate into grains which, if inspected with a magnifying glass, will indicate something of the sharpness and assortment of the sand

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Especially designed cutting blade and dies assures fast cutting action. . . . The hammer principle eliminates any special skill requirements.

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No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.

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The enclosed cutting blade locked in the body of the cutter assures perfect safety.

#### and it's

#### PORTABLE...

Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1 1/16 inch, 1 1/2 inch.

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on your  
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Be sure to have your new trailer dumps equipped with the NEW Dun-Lockin' Automatic Tailgate Lock for **efficiency, economy** and accident prevention!

1. The driver never has to get out of cab;
2. Entirely mechanical (not air or hydraulic) and trouble-free;
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CONTRACTORS AND ENGINEERS

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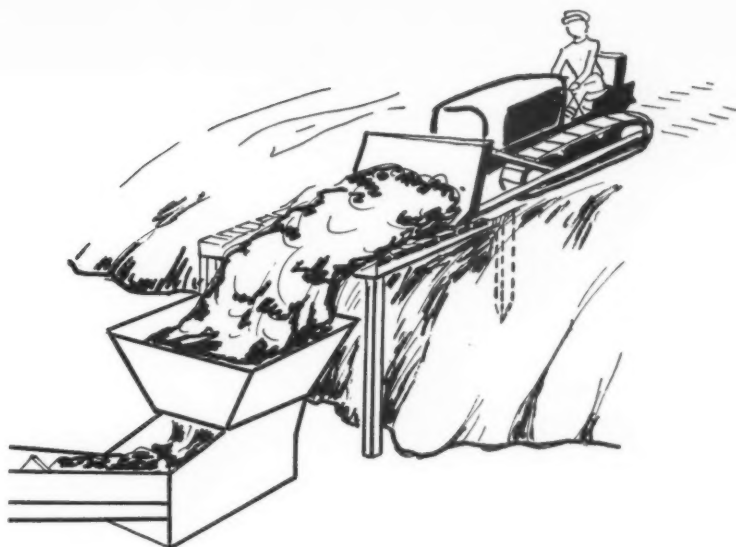
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Loading a hopper with a bulldozer.



particles in the gravel.

A sample, with stones over  $\frac{1}{4}$  inch removed, can be shaken up with water in a glass jar, then allowed to stand. The pebbles will form a layer in the bottom, with coarse and then fine sand on top. Silt and clay will settle out more slowly, and may take an additional day to compact. The relative amounts of the different size particles can then be determined by inspection.

In the laboratory, gravel is dried, weighed, and put through a vibrating screen with many different meshes. The particles caught on each tray are weighed. Any lumps have to be broken up. This operation gives a classification of the specimen for size gradation.

Gravel can be tested for abrasion

resistance by rolling it in a cylinder with steel balls or other hard weights. Resistance to breaking up by freezing can be tested with cold, or with chemicals which duplicate its effect.

Clean bank gravel of proper sand-gravel proportions is frequently mixed directly with cement for concrete.

#### Sand

Most bank-gravel deposits are more than half sand. In addition sand deposits occur over areas where no gravel is found.

Ocean beaches are typically sand, and river deposits usually contain high proportions of it. If the river flows slowly, the sand may be mixed with silt and clay, which usually must be separated from the sand.

Most sand is largely particles of

silicon dioxide, best known in the form of quartz. It is very hard and withstands the abrasive effect of water, which reduces other minerals occurring with it to fines. Calcium carbonate, mica, feldspar, gypsum, and many other minerals may also occur as sand.

Many sand banks are clean enough for use without processing, but in most cases it is safer to screen and wash the sand before using it in concrete.

Sand and gravel deposits occur in all parts of the world, and with spe-

cial frequency on or near past or present shores, glaciers, and mountains. They may be thin, irregular deposits, or in heavy masses. In general, gravel is more variable than sand in size and type of particles and thickness and shape of beds.

Running water needs higher velocity to carry large pieces than small, and in general, gravel is deposited nearer the source than sand, or at times of heavier stream flow. However, a stream which is building up a deposit alternates in bringing in materials and cutting parts of it

light as a feather  
... strong as an ox!



### THE NEW TULSA® POWER TAKE-OFF SINGLE SPEED • MEDIUM DUTY

Extremely light... you can hold it in the palm of your hand... because the NEW TULSA Power Take-Off has a die-cast aluminum housing which at the same time gives all the ruggedness and durability for which the TULSA line is famous around the world. Output shaft available in three sizes— $13/16"$ ,  $7/8"$  and  $15/16"$ —and rotates on two needle bearings. Furnished with either cable or lever control to suit individual operators' requirements. Designed and built for the full range of medium duty work, this new power take-off offers the extra advantage of low price, nationwide distribution and service that have made the TULSA line a favorite everywhere.

**Tulsa Winch**  
DIVISION OF  
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JULY, 1956

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IF WE SEEM TO  
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COMES TO BUILDING  
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away. Channels wander over the whole area. Oversize material beyond the capacity of the water to carry may be rolled long distances along the bottom. Clay and silt may be deposited in temporary pools.

The result of these factors is that gravel, sand, and clay deposits are often extremely variable and uncertain. When this is the case, mining them requires constant good judgment in deciding which horizons should be combined and which separated; and what can be used and what must be wasted.

#### Processing

Sand and gravel may be processed to clean out dirt; to separate into different sizes; to combine different sizes and materials; to remove or crush oversize stones; and for combinations of these purposes.

The processing plant proper may consist of a washer, a screen, a crusher, or multiples or combinations of these units, together with feed hopper, and transfer and discharge conveyors. These plants are available in both self-propelled and portable types.

By the use of units of proper size, any desired reduction, combination, or separation can be secured. It should be remembered, however, that no plant can produce a coarse product from fine particles. Deficiencies in gravel content must be made up by mixing in stone of proper size, or oversize up to the crusher capacity, in addition to the run-of-pit material.

Clay, like sand and gravel, may be found in massive deposits or in irregular layers and lenses. It is often interbedded or mixed with other materials in very complex ways.

Underwater clay may be soft enough to be dug with a small drag-line, or quite hard. Dry clay grades from hard shovel digging to shales requiring heavy blasting.

Pit operators usually find it economical to loosen up dry clay with at least light blasting, to facilitate digging. Electric or gasoline-driven augers are extensively used for drilling, and slow to standard dynamites for blasting.

When valuable clay is in narrow and confused beds it is often blasted, then separated by hand into piles which are loaded by machine.

#### Loading out of the bank

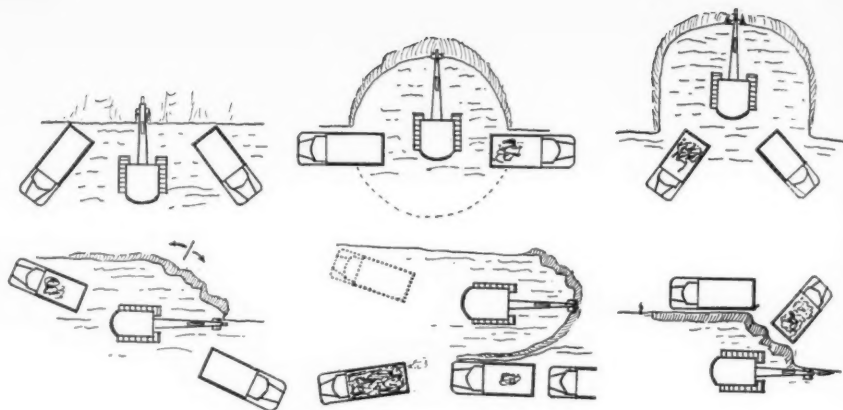
Most primary pit excavation is in formations deep enough to be loaded directly from the bank. The material may be in its natural state or loosened by blasting.

In free-flowing materials, such as loose dry sand, the only limit to bank height is that imposed by safety.

If a formation will stand in vertical or overhanging walls, and is dug from the bottom, the face should not be higher than the machine can reach. Half this height will usually be more convenient and give better production. For example, dipper shovels of 2½-yard capacity seem to do best when the bank is between 12 and 15 feet high.

Lower faces require more frequent moves. Higher ones require the

Loading from a bank with a dipper shovel.



## why you make more money with BLAW-KNOX PF-90 paver-finisher.

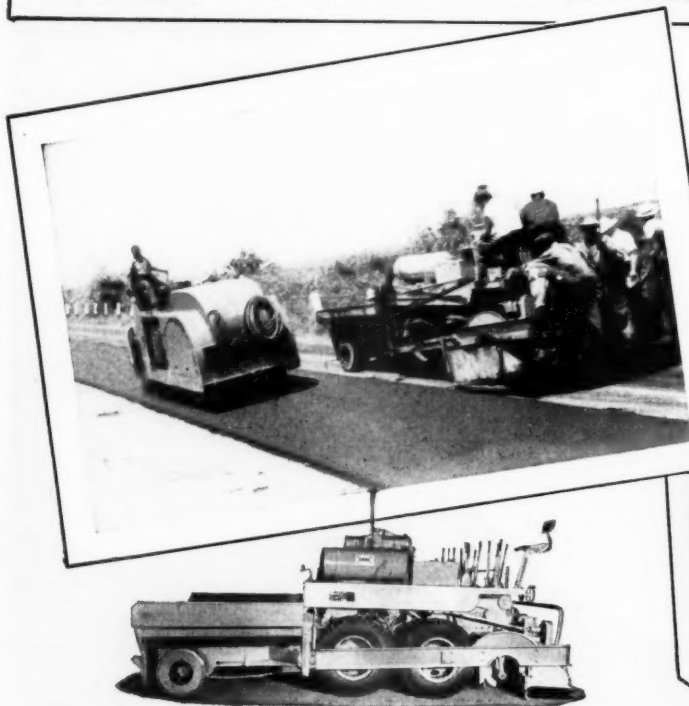


#### Traction to Push Boxcar Size Trucks

Handling 15-ton trucks up a 12% grade, as shown at left, is typical of the performance of a Blaw-Knox PF-90 Bituminous Paver Finisher. The PF-90 has a top power, 71 H.P., than any other blacktop paver. This power is efficiently transmitted through tandem axle drive to four large pneumatic-tired wheels. They have the proper combination of flotation and traction to push 15 and 20-ton trucks up steep grades on such uncertain conditions as tack-coats and stone material subgrades. Pneumatic tires the proper tread have long been proven superior over smooth crawler tracks for flotation and traction when working the conditions encountered by a paver.

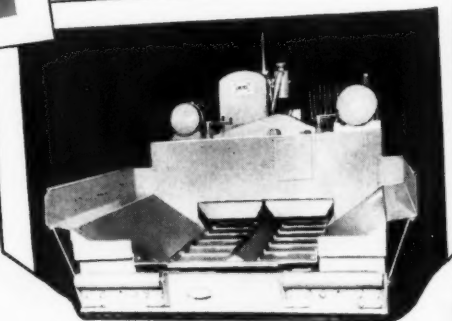
#### More Speed and Maneuverability

Paver speed can only be measured in time required to complete the paving. In addition to working speed in feet per minute of finished paving, where the PF-90 exceeds most machines, you also consider time consumed for rearing and maneuvering for restarts. The PF-90 runs away from every thing shown at left, the Blaw-Knox Paver can make a long run back for restart crew, in a fraction of the time it takes a crawler mounted paver to turn along the same distance at 1½ mph.



#### 600 to 700 Less Wear Parts

With only six rubber-tired wheels instead of 600 or 700 exposed steel parts wearing against each other, which is common to crawlers, a Blaw-Knox PF-90 has much lower maintenance cost. In addition to few wearing parts, rubber-tired mounting absorbs vibration, reduces chatter in screed and wear and tear on the entire machine. The PF-90 frame is so ruggedly designed and constructed that it can take the road strains and vibration to make a Paver that continuously delivers good results.



#### Big Hopper for 10-Ton Load

You can feed approximately 10 tons in the wide and deep PF-90 hopper, twice as large as any similar paver. It takes care of the full truck width without spillage. Large size reduces truck dumping time so you can use fewer hauling units.

bucket to travel farther with resultant loss of time.

Loading machinery used for pit excavation can be roughly divided into tractor loaders, which depend on traction on the pit floor for digging power; revolving shovels with dipper, clamshell, or skimmer front ends, which stand on the floor while working; revolving shovels, with dragline, hoe, or clamshell rigs, which load from the top of the bank; scrapers and bulldozers, which work down the bank slope; and remote-control cable-way excavators.

Selection of machinery will depend on the location and digging charac-

teristics of the formations, the volume of output required, the type and importance of other work that must be done by the same machines, the type of haulage or conveyor units, and the price tags.

Big machines are suited to hard and coarse formation and to high production requirements.

Practically all excavators are available in different sizes. Production usually does not increase in direct proportion to power and weight, as the more massive construction of heavier units may require lower speeds, and space may be lacking for convenient operation.

Production ratings based on loose yards, or on a 60-minute hour, will be higher than for bank yards, or a 50-minute hour.

Also, there is room for honest difference of opinion about whether a formation is hard or soft, and conditions average or ideal.

A rough index to output can be obtained by timing a machine at work in various materials. A stop-watch should be used and the results written down. The cycle time is the elapsed time between a certain movement, as entering the bank, and the repetition of the movement. The average number of cycles per minute, from a num-

ber of observations, multiplied by the average bucket load in yards, will give the production rate in yards per minute in simple work such as side-casting. Extra passes made to trim the bottom, or to break out or avoid boulders, may be averaged in or considered separately.

If the machine is loading, the loss of time in spotting trucks and trimming up their loads should be observed.

The figures obtained must be modified to allow for mechanical difficulties, maintenance, cigarette time, failure of trucks to keep up their schedule, blinding dust, and inspection of bank material. These are often lumped together as 1/6 of operating time, so that each hour is figured to have only fifty working minutes. If the calculation is to determine the number of days required to do a job, weather must be allowed for. This will include the time the job is shut down because of rain and resulting mud.

#### Picking the rig

Big machines can almost always dig hard material better than small ones of the same type, but this factor is even harder to calculate. A rough index to penetration in material of even texture can be obtained by dividing the force which can be applied to the bucket by the width of the edge or the combined width of the teeth. The extra resistance to the thicker teeth of the heavy bucket may be negligible in brittle formations and important in resilient ones.

In poorly blasted rock, or boulder-filled banks, the gain in penetration is much greater, as nearly the full power is often applied in succession to points of greatest resistance.

A wide bucket may be at a disadvantage because of inability to get between obstacles to attack them separately, or benefit from its capacity for large chunks.

In any digging, sharp cutting edges are essential to best work. In hard formations, teeth of proper spacing will give better results than straight edges.

Mobility is an important factor for machines which may dig for short periods from a number of different bank sections, or are used for loading from storage piles as well. Ability to do several types of work is liable to be useful, particularly in small pits.

It is good practice, although not always essential, to match the size of loading and hauling units. If large shovels are used with small trucks, time is wasted centering the bucket and material will be spilled off the sides. Truck tailgates may be jammed by oversize pieces and trucks damaged by impact. If the trucks are too large for the shovel, they must spend too much time being loaded; the shovel may be unable to fill them from one stand, and high body walls may hamper it.

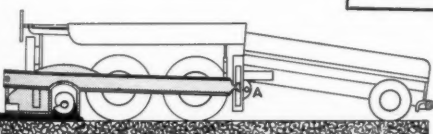
Revolving shovels are usually teamed with trucks which will carry between five and ten bucket loads. Capacity is not as important for tractor-loaders but body walls should be

## Finish every Black Top Paving Job! and always do Top Quality Work

### Easy Wheel Steering gives Light Longitudinal Joints

For top quality work, such as this rigidly finished airport job, the power steering efficiently allows fine maneuvering to maintain a straight longitudinal joint. Hydraulic control wheels combined with rubber-tired mounting of float provide the ultimate in steering to the most accurate control. Commanding this with crawler-mounted rigs can only be steered by pivoting entire machine.

been provided control gates and extra large diameter augers assure better distribution of material for the high paving speed of the PF-90. Vibrating bar tucks material under to a uniform density.



**Automatic Leveling on Long Wheelbase**  
A combination of long wheelbase that spans subgrade irregularities and the screed with a floating pivot point, A, in front of the driving wheels, assures a constantly true course of the proper minimum thickness.

### Fast Widening of Vibrator and Screed

In a matter of minutes, screed, tamper and auger can be set at any desired width from 8 feet up to 13 feet. Auger sections merely slide into recessed end of existing auger and are pinned. Screen and tamper section fasten face-to-face and are held by a minimum number of bolts in each. In addition to ease of width change the PF-90's 8-foot basic width, 2 feet narrower than any other paver, allows it to fit driveways and alleys and facilitates transporting.



#### BLAW-KNOX COMPANY

Gentlemen:

Please send me Bulletin 2475 on the PF-90.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

**BLAW-KNOX COMPANY**  
Construction Equipment Division  
Charleston Avenue • Mattoon, Illinois

—For more facts, circle No. 355



## THE AMAZING HANCOCK 10 YARD ELEVATING SCRAPER



**MOVES UP TO 200 YARDS OF EARTH PER HOUR,** depending on the haul, at one third the normal cost. Yet you can own one for considerably less than the price of an ordinary scraper.

- self-loads, elevates, pulverizes the dirt and spreads it.
- cuts from 1/2 to 6 inches deep in any soil.
- works efficiently with any tractor of 75 HP or over.
- hydraulically controlled
- adjustable high clearance
- turns in only 28 feet.

And there are other Hancock money savers. The agriculture series of elevating scrapers in 5 and 8 yard models. **WRITE FOR INFORMATION.**

**HANCOCK**  
MANUFACTURING CO.

Lubbock, Texas

For more facts, use Reader-Reply Card opposite page 18 and circle No. 356

(Continued from preceding page)

low enough to allow for easy placement.

### Types of machinery

Tractor loaders include crawler types, which can do moderately hard digging and heavy bulldozing, and units on rubber-tire wheels, which generally will dig only soft or loose material, and should operate on hard ground. The wheel units have smaller buckets for their power and weight and are usually cheaper to buy and to maintain.

Crawler-mounted loaders are easy enough to move around pits of moderate size, but the wheel mountings are superior in speed and cause less wear to themselves and to the roads

while traveling over the highway.

Four-wheel-drive loaders have digging power intermediate between the two types and have the mobility of the wheel mountings.

Three types of buckets are used: the hydraulic dump, the gravity dump, and the overhead. Hydraulic dump is much superior to gravity for most uses and is slightly more costly.

The dipper shovel is the standard tool for bank excavation. Although fastest loading is in soft material that will help on the bucket, they can maintain good output in very hard or rough material. They are more costly in proportion to capacity than the tractor loaders, but have lower repair requirements as the tracks do not move during the digging cycle.

In the smallest sizes, and when mounted on wheels in any size, they have good mobility. Medium and large sizes are generally not moved around for less than a day's work.

They will dig from any graded floor that will support trucks. Best production in non-caving material is usually obtained when the bank is about as high as the shipper shaft (dipper stick hinge).

The skimmer shovel is not widely used because of lack of flexibility. It is particularly suited to shallow cuts. It easily works to grade and leaves a smooth surface. Methods are similar to those for the dipper type.

The clamshell is so versatile that it is difficult to set up patterns for it. It can stand at the foot of a fairly high bank and dig from the top, or stand on the top and dig from the foot, or can work at any intermediate level. It digs straight down, gathering in its load, without pushing or pulling the surplus. These features make it very valuable in selective digging.

The dragline is the best machine for loading from the top of the bank if it can dig the material. Small draglines usually are quite helpless in tight or rocky soil, but very large ones will dig almost anything a ripper can penetrate.

Difficulty of penetration increases with depth. For deep work, the boom should be long and digging done well out. This minimizes the upward pull of the drag cable, which decreases the effective weight of the bucket.

A dragline can dig harder material from a face than it can cut vertically. If a wide ditch is started by other machinery, it can be continued back into the bank by a dragline. If hard, it will tend to narrow down and become shallow.

The pull shovel or hoe has a shorter reach than the dragline and will dig harder material. It loads more slowly and should be higher than the truck. Height may be obtained by spotting the trucks on the pit floor, while the hoe works on top of the bank or by building up a platform for the shovel.

Scrapers are not ordinarily considered to be bank-digging tools, but under proper conditions they may give lowest cost on combined digging and hauling.

Bulldozers can load trucks from banks high enough to permit the machine to push into or over the body. For occasional loads, this may be

## TEAMMMMED TO OUTPERFORM IN EVERY AUSTIN-WESTERN POWER GRADER



Power in the front drivers makes it safe to work along the top of a steep bank.



The teamwork of All-Wheel Drive and All-Wheel Steer makes the grader as sure footed as a mule.



Working upgrade on hairpin switchbacks is easy for the A-W grader.

### All-Wheel Drive, All-Wheel Steer work together...doing things impossible for ordinary graders

Graders with rear drive only have to push the lazy, dead weight of the front end, which requires extra power and thus lowers the operating efficiency. Put power on the front wheels and you get working weight—not dead weight. Then all weight is on driving wheels, contributing 100 percent to traction.

All-Wheel Steer makes Austin-Western graders twice as maneuverable as those with front steer only; steering that lets you "swing that rear-end" for handling every job with maximum efficiency.

All-Wheel Drive for maximum mobility and 30 percent more Power-at-the-Blade—power that is made still more effective by Torque Converter drive. All-Wheel Steer for extreme maneuverability. Put them together and you have teamwork that keeps Austin-Western Power Graders working where other graders fail. Austin-Western Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Aurora, Illinois.



**AUSTIN-WESTERN WORKS**

**BALDWIN-LIMA-HAMILTON**

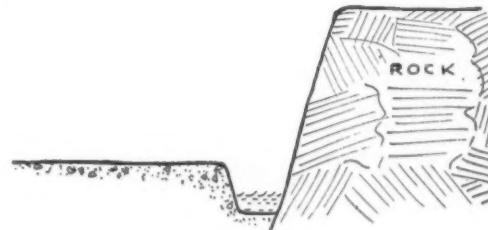
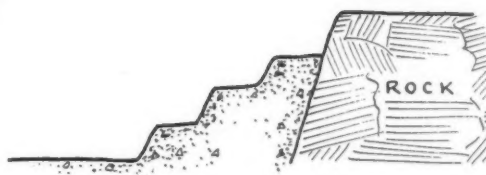
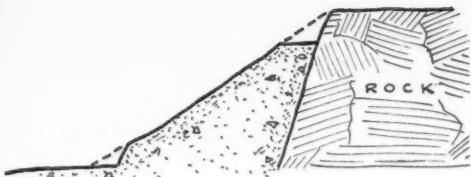
Construction Equipment Division

OTHER DIVISIONS: Eddystone • Lima • Electronics & Instrumentation • Hamilton • Lowey-Hydropress • Standard Steel Works • Madsen • Pelton

Power Graders • Motor Sweepers • Road Rollers • Hydraulic Cranes

For more facts, use Reader-Reply Card opposite page 18 and circle No. 357

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Three steps in benching from the top and bottom.

done directly from the bank. A considerable amount of material is usually lost in building the bank out to the truck, and repeated loading extends the bank out into the pit, requiring a longer push with each load. Also, the truck may get stuck in the spill.

Cable excavators are permanent or semipermanent installations which should have enough digging within reach to repay the investment. They usually serve as hauling as well as digging equipment.

The drag scraper is the easiest and safest means of digging a high bank which slides or caves. No equipment is needed near the toe, and only the light tail tower and anchors at the crest. If the far side of the crest is accessible, steepness can be reduced as digging progresses.

If the spoil is to be moved a considerable distance across the pit from the toe, a three-drum slackline may be used instead of the drag scraper.

#### Benching

It is usually good practice to limit the height of shovel cuts by taking the materials in a series of layers or benches.

Pits are liable to take much larger areas and require many more benches.

Benching may be done from the top down, or from top and bottom.

A boundary cut is frequently carried down below the pit floor when the higher parts are exhausted.

A large number of benches may be worked at the same time, or in rotation.

Each bench should be large enough to provide ample space for shovel and trucks. If it is accessible at each end, one-way traffic can be maintained and the need for turnaround space avoided. However, narrow roads are often blocked by stalled vehicles, slides, rockfalls, or overbreaks.

If the bench is accessible from only one end, the shovel should work from that end so that the width of the new cut will be available to traffic.

When layers are taken from the top down, starting at a hillcrest, or a backline which will stand steeply, the working area may be made about as wide as desired. The excavating done on the top widens the area available for the next cut.

When cuts are worked up from the bottom, width is largely determined by slope gradient and face height. If the slope is 45 degrees, a foot of height is required for each foot of bench width.

Top benching is preferred for steep slopes whenever immediate access can be had to the top.

(To be continued next month)

**Eliminate**  
**STEP**  
**CUTTING**

**ONE BLADE**  
**ONE PASS**  
**ONE WIDTH**

**cut costs 50%**

**with carbide bonded blades**

The new Carbide Bonded blade cuts a clean, constant width, easy to seal joint in **one pass**. Although field reports show Carbide blades last 2 to 3 times longer than all ordinary diamond blades, the cut virtually **remains the same width** throughout the life of the blade.

Write today for full information and prices.

**Consolidated**  
**DIAMOND TOOL CORP.**  
320 Yonkers Avenue, Yonkers, N. Y.  
\*Patents Pending.

CONCRETE AND MASONRY CUTTING BLADE DIVISION

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**important**  
**books**  
**just**  
**off the**  
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#### The first complete treatment of **FOUNDATIONS**

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Consulting Engineers

In one convenient volume, here is complete up-to-the-minute information on all phases of foundation work: design, construction methods, costs, specifications, field practice, subsurface exploration work, inspection, foundation reports, specifications, contracts, and every important related subject. The author, who has probably designed more foundations than any other living engineer, provides all necessary information together with the important *do's* and *don'ts* of successful design and practice. 1956 466 pages Hundreds of drawings and illus. \$16.00

#### **LEGAL PROBLEMS** **IN ENGINEERING**

By MELVIN NORD, Consultant in Law and Engineering,  
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The practical and comprehensive guide; helps avoid legal pitfalls. Explains legal problems carefully and presents ruling law cases to clarify the problems in the light of legal principles and actual court experience. 1956 391 pages Illus. \$7.50

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## manufacturer memos



The newly appointed sales manager of the eastern division of Caterpillar Tractor Co., E. C. Chapman.

### Caterpillar promotes

The Caterpillar Tractor Co., Peoria, Ill., has promoted four executives to new positions within the firm. E. C.

Chapman, former assistant manager of the eastern division, has been appointed sales manager of the division. A civil engineer, Chapman has been associated with Caterpillar since 1945. He succeeds W. E. McCoy, who has been transferred to the San Francisco, Calif., office.

Frank Foster will assume Chapman's former post in the eastern division. He had been assistant sales manager in the southwest division, and that position will be filled by the former northwestern division district representative, Ralph Ehni.

Lloyd J. Ely has been promoted to the post of director of manufacturing. He had been manager of the firm's Peoria plant. In his new position, Ely will be responsible for the general administration of manufacturing func-

tions at seven domestic plants and will also give guidance to the manufacturing general office.

### Koehring Co. to acquire Hydraulic Press Mfg.

The Koehring Co., Milwaukee, Wis., construction machinery manufacturer, plans to acquire the Hydraulic Press Mfg. Co. of Mt. Gilead, Ohio, through a statutory merger. More than 44,533 shares of Koehring common and more than 53,439 shares of a contemplated new Koehring preferred stock will be issued in connection with the \$5,000,000 transaction.

The merger is in keeping with both firms' efforts toward product diversification. Julien R. Steelman is president of Koehring, and G. B. Robinson is chairman of the board of directors of H-P-M.

### Intrusion-Prepakt names Atlanta office manager

Norman L. Liver has been appointed regional manager of the Atlanta, Ga., branch office of Intrusion-Prepakt, Inc., Cleveland, Ohio, specialist in heavy concrete structures and foundations. He has been associated with the firm since 1950, working on the development of the company's mixed-in-place pile method.

A civil engineer, Liver is a graduate of the University of Illinois and is a member of the American Society of Civil Engineers.

### Changes at Marion

John J. Drollinger has taken the post of manager of repair sales of Marion Power Shovel Co., Marion, Ohio, replacing William A. Dunning, who resigned to become vice president of Depco Detroit Corp., a Detroit dealer.

Drollinger, who started with Marion as a production clerk in 1927, has been assistant to Dunning since the first of this year. His position of assistant manager has been filled by James P. Baker.

Paul P. Smongeski, made manufacturing engineer by Marion, will work with the firm's manufacturing and engineering departments in coordinating product-development and production.

### Thor elects DeBacher vice president of firm

Jack R. DeBacher, executive vice president of the Thor Speedway Mfg. Division, Cicero, Ill., has been made a full vice president of the Thor Power Tool Co., Aurora, Ill. In his new post-



Thor's new vice president, J. R. DeBacher.

tion, DeBacher will be concerned with centralizing manufacturing sales, and engineering divisions of the firm.

DeBacher will work from Thor's administrative headquarters in Aurora until the company's new executive offices in the Prudential Building in Chicago are completed in the near future.

Another Thor appointment is the selection of Frank J. Weitekamp, secretary of the firm. Weitekamp, also comptroller and treasurer of the Thor Speedway Division, had been comptroller and assistant secretary-treasurer of the firm since 1945.

He succeeds John A. McGuire, who was recently named vice president and chairman of the executive committee.



## 3-WAY SOIL BLENDER!

Here's the one multi-purpose tool every contractor needs to speed his work and make him more money! Solving soil problems is a specialty of Rome Disk Plowing Harrows. Have you ever encountered these problems?

**1 Dead, dry dirt on the fill** that blades like ashes and packs like sawdust? Wet it down with your water trucks, then mix it deep with a Rome Disk Plowing Harrow to put it in good shape for specified compaction.

**2 In-place materials to mix?** Soil cement materials, stratas or lifts in fills can be readily turned into a compact, homogeneous fill by mixing and pulverizing with a Rome.

**3 Too wet to work?** Blend wet soil with dry materials, plow deep with a Rome Disk Plowing Harrow to dry out your fills and cuts.

See your Rome Dealer for complete details — he is also your Caterpillar Dealer.

ROME PLOW COMPANY, Cedartown, Georgia

**Rome Disk Plowing Harrows**

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**SARGENT Makes Only One Size . . .**

THE EXTRA HEAVY DUTY  $\frac{3}{8}$  YARD  
**Sargent** MODEL 410  
SHOVEL-CRANE

If your present shovel-crane line doesn't include a  $\frac{3}{8}$  yard machine, SARGENT is not competitive.

Write for complete information, specifications and prices to:

**SARGENT ENGINEERING, INC.**  
Fort Dodge, Iowa



SHOVELS • DRAGLINES • TRENCH HOES • CRANES  
TRUCK OR CRAWLER MOUNTED

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CONTRACTORS AND ENGINEERS

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## B-E sales manager for large machines

Effective the first of this month, Lewis C. Black takes over as sales manager of large machines for Bucyrus-Erie Co., South Milwaukee, Wis. He succeeds R. M. Dickey, who resigned.

Black will be responsible for all domestic sales of walking draglines, stripping shovels and draglines, rail-



Lewis C. Black, sales manager for large machines for Bucyrus-Erie Co.

way cranes, and quarry and mine machines. He joined Bucyrus-Erie in 1935, and served as a district representative in Chicago, St. Louis, and New York before becoming assistant eastern district manager in 1955.

## Fairbanks, Morse elects three new officials

Two new vice presidents and an engineering executive were elected by the board of directors of Fairbanks, Morse & Co., Chicago, Ill.

Robert H. Morse, III, now vice president in charge of sales, had formerly been sales manager. The new vice president in charge of purchases, D. L. Harwood, was the former general purchasing agent for the firm.

J. F. Weiffenbach, formerly chief product engineer, was elected director of engineering.

The firm has already completed the relocation of its electronics division, moving it from Davenport, Iowa, to East Moline, Ill. This division was opened in 1949 to engage primarily in research, and took on the job of

manufacturing electronic weighing equipment in 1954. The move to 1109 14th Ave., East Moline, was made necessary because of the division's expanding sales and the consequent need for greater manufacturing space.

## International Harvester makes executive changes

Four changes in the executive organization have been made by the International Harvester Co., Chicago, Ill. The former president of the firm, John L. McCaffrey, has been elected chairman of the board of directors. He will be succeeded as president by Peter V. Moulder, the former executive vice president.

Frank W. Jenks, previously vice president in charge of merchandising

services, has been elected executive vice president, and Harry O. Bercher will also serve as executive vice president. He had been vice president in charge of the steel division and purchasing and traffic. Christian E. Jarchow, an executive vice president since 1952, will continue in that position.

## "Quick-Way" Truck Shovel elects new president

Clinton D. St. Clair has been elected president of the "Quick-Way" Truck Shovel Co., Denver, Colo., manufacturer of truck-mounted power shovels and earthmoving equipment. He is also a vice president of the Penn-Texas Corp., of which "Quick-Way" is a subsidiary.



Clinton D. St. Clair, president-elect of "Quick-Way" Truck Shovel Co.

Prior to joining "Quick-Way", St. Clair served as vice president in charge of manufacturing for the Lunkenheimer Co., valve manufacturer of Cincinnati, Ohio.

## Vice president of sales named by Macwhyte Co.

Francis D. Holden has been elected vice president in charge of sales for Macwhyte Co., Kenosha, Wis.

# Announcing...

## THE ALL-NEW COMPLETELY REDESIGNED Cedarapids JUNIOR TANDEM

### with these BIG NEW FEATURES

#### YOUR CHOICE OF CRUSHER SIZES

Whatever your pit conditions, you can meet crushing requirements right on the nose! With high crushing percentages, use the 10" x 36" jaw crusher for extra primary capacity. In average conditions, choose the 10" x 24" jaw crusher. Meet normal secondary reduction requirements with a 24" x 16" roll crusher, or where percentages of fines are high, use the 30" x 18" roll crusher. Mix 'em and match 'em for balanced production on your job!

#### BIGGER SCREEN

The width of the horizontal vibrating screen has been increased 6 inches, and a half deck has been added. Now the 42" x 10', 2 1/2-deck screen assures much higher screening capacity, plus greater flexibility for producing from one to three products simultaneously in sizes from 2" road ballast down to minus 1/4".

#### CEDARAPIDS "BIG PLANT" FEATURES

In the new Junior Tandem are many features found in larger Cedarapids plants—sand ejector screw; washing spray bars (optional); new mono type elevating wheel; delivery conveyor backstop; belt wipers; self-cleaning pulleys; new type adjustable eccentric on reciprocating feeders; larger hopper; separate clutch control on screen.



Write for details today! Only a complete description of every improved feature on the new Junior Tandem can show you what this plant can do on your job. Write for information, or see your nearest Cedarapids distributor for design details and specifications.

**IOWA MANUFACTURING COMPANY**  
Cedar Rapids, Iowa, U. S. A.

**PORTABLE  
ELECTRIC  
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*Right on any job!*



**PORTABLE POWER PLANTS**

Right — you save time . . .

Right — you speed work . . .

because with Katolight Portable Power Plants, your crews have "plug-in" electricity instantly available to operate all types of tools, equipment and lights right on the job, whether it's highway, or light or heavy construction. Sizes and models, right for every portable, standby or continuous use, from 350 watts to 50 KW, AC. Up to 500 KVA on request.

**It's New!**

WRITE FOR FREE FOLDER  
ON NEW LIGHTWEIGHT  
PORTABLE MODELS

**Katolight CORPORATION**  
Box 891-S, Mankato, Minnesota

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**Faster, Safer, More Economical  
and Look No Wire Waste!**



**You save time**—when you change from outmoded wire-tying methods to IDEAL reel. Get 6 to 8 more ties per minute than with clumsy, over-the-head wire coils. No chance for time-consuming tangles, bent or kinked wire. *Saves wire . . . and money, too.*

# IDEAL<sup>®</sup>

## Tie Wire Reel

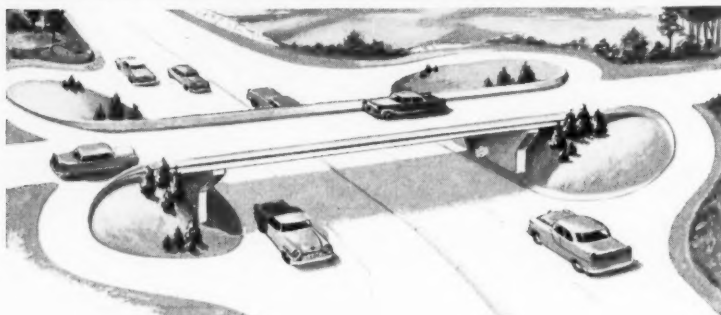
**Puts wire waste to work!**

Yes—IDEAL reel stops costly wire waste. *Actually puts it to work.* Gives 33% more usage per pound of wire, on average. Increases tying speed 25% . . . often much more. Safeguards workers. Discover for yourself how IDEAL reel can speed your tying jobs . . . safely . . . and cut job costs, quickly and economically.

**Write—Wire—Phone—Collect**  
For full details

**Ideal Reel Company, 328 Harahan, Paducah, Ky.**

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**Here's why you should make  
PRESSTITE-KEYSTONE a**



**for all your  
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product needs**

- EXPANSION JOINTS: PRE-MOULDED ASPHALT AND NON-EXTRUDING FIBRE OR KAPCORK<sup>®</sup>.
- ASPHALT BOARDS: TONGUE AND GROOVE JOINTS; DUMMY JOINTS.
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- KAPCO<sup>®</sup> HOT POUR ASPHALT-RUBBER JOINT SEALING COMPOUND.
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- CONCRETE CURING COMPOUND.
- SUB-GRADE FELT . . . AND MANY, MANY MORE.

**• ONE COMPLETE BUYING SOURCE**

No need to shop around when you can get all your wants in this giant supermarket of paving products. If you use it . . . we have it.

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Why carry a big inventory on low-need items? Stock only what you'll need—carry a more diversified stock—when you order under Presstite-Keystone's freight-saving "Mixed Carload Plan." Ask us about it.

**• ONE CONVENIENT INVENTORY & BILLING ACCOUNT**

Less paper work, easier and faster handling, more net profits for you.

**• FAMOUS-NAME QUALITY**

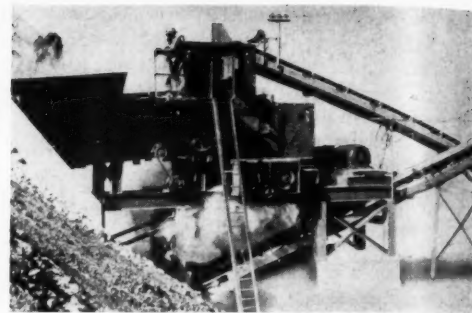
Two reliable names combine to bring you controlled quality, reliable delivery—and a personalized engineering service whenever you need it.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 366

The new Pioneer Cuber Senior Model 3648 is suitable for both portable and stationary installations.



**Impact breaker added to line of crushers**

■ A dual-rotor, up-running impact breaker utilizing a new multi-stage, triple-action reduction principle is being marketed by Pioneer Engineering Works, Inc. The Cuber Senior, Model 3648, is said to be suitable for both portable and stationary installations and for both primary and secondary breaking of non-abrasive stone.

With an adjustable rock-deflecting baffle, provision for varying the speed of the hammers, and an adjustable discharge grate, the Cuber Senior produces a wide range of aggregate

sizes with full gradation control, the manufacturer states.

Operating under favorable conditions in a closed circuit, the breaker will produce up to 350 tons per hour of minus-3-inch, up to 275 tons per hour of minus-2-inch, and up to 150 tons per hour of minus-1-inch aggregate. A power supply in the 150 to 250-hp range is required.

For further information write to Pioneer Engineering Works Inc., 1515 Central Ave., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 13.

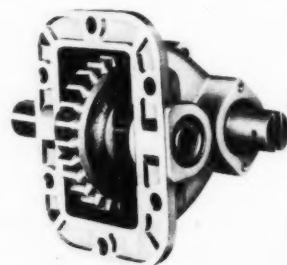
**Truck power takeoff has aluminum housing**

■ A new single-speed, single-gear truck power takeoff for medium-duty operation is announced by the Tulsa Winch Division of Vickers, Inc.

The Series 22 is manufactured in nine different models. The entire series offers die-cast aluminum housing for light weight and extra strength; three optional output shaft sizes; hardened, shaved gears that mesh with the transmission only while takeoff is operating; heavy duty oil seals; and optional cable or lever control.

The Series 22 takeoff units can be furnished in any of four assemblies.

For further information write to the Tulsa Winch Division of Vickers,



Die-cast aluminum housings make the new Tulsa power takeoff units lighter and stronger.

Inc., 815 E. First St., Tulsa 2, Okla., or use the Request Card at page 18. Circle No. 99.

**FINEST PRECISION SWIVELS IN THE WORLD**



SCRAP MAGNET HOOK UP

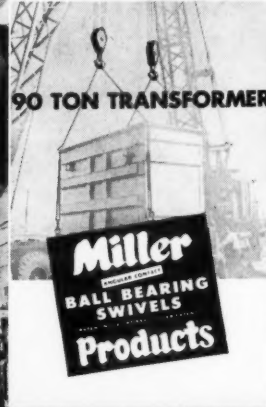
→ There are many practical, diversified uses for Miller Swivels, in capacities from 700 lbs. to 250 ton. 16 different styles in stock . . . special adaptations designed on request.



50 TON PLACEMENT



HYDRAULIC TOWERS



90 TON TRANSFORMER



MILLER WEDGE SOCKET



**GENERAL MACHINE & WELDING WORKS inc.**  
1100 East Second St., Pomona, Calif.

P. O. Box 938

Dept. C-2

FACTORY REP.:  
L. T. Waltrim,  
Bakersfield, Calif.;  
Higgins & Linde,  
Inc., Chicago, Ill.;  
W. W. Walker, Al-  
buquerque, N. M.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 367

**CONTRACTORS AND ENGINEERS**



The International Model VF-192 six wheeler with a dump body. The new V-line is being offered in nine series, consisting of conventional and cab-over-engine models in both four and six-wheel design.

### Introduce new series of heavy-duty trucks

■ A new V-line of International heavy-duty trucks, featuring three new V-8 engines, is announced by the International Harvester Co.'s motor truck division. Nine series of trucks in conventional and cab-over-engine models, four and six-wheel design, comprise the V-line. Models are available with gvwr ratings of 24,000 pounds and up, and gross combination weights of 50,000 pounds and up.

Power is supplied by new International V-8 engines of 401, 461, and 549-cubic-inch displacement, with

hp ratings of 206, 226, and 257.

Conventional four-wheel models are available in the V-line in the Model V-195, and the V-200, V-210, and V-220 Series; and conventional six-wheel models are included in the VF-190 and VF-200 Series. Cab-over-engine models are available in the VCO-195, VCO-200, and VCO-220 Series.

For further information write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 80.

### Payroll tax computer

■ A payroll tax computer, the Calculator-D, shows FICA and withholding-tax deductions all on one line, according to a mailing piece from Ayers Corp. The computer measures 9 inches long by 4 inches high, and weighs 16 ounces. A drum chart inserted in the

computer gives daily, weekly, or monthly payroll tax data, according to the needs of a company.

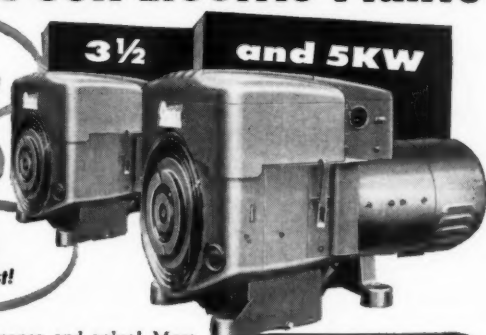
To obtain the mailing piece write to Ayers Corp., P. O. Box 1081, Wilmington, Calif., or use the Request Card at page 18. Circle No. 25.

## New ONAN CCK Electric Plants

**MORE OUTPUT**  
per pound of weight!

**MORE OUTPUT**  
per gallon of fuel!

**MORE OUTPUT**  
per dollar cost!



Way ahead in performance and value! More powerful, two-cylinder, air cooled Onan gasoline engines of 4-cycle, horizontally-opposed design give smooth, quieter, effortless performance. Short stroke and moderate speed cut engine wear, give longer life. Quality features include rotating Stellite-faced exhaust valves, solid Stellite valve seat inserts, full pressure lubrication. Onan's exclusive Vacu-Flo cooling system available for difficult or "buried" installations.

Completely Onan-built, with Onan gasoline engines direct-connected to Onan all-weather generators in compact, rugged units. Available in stationary, portable and standby models with a wide range of accessories.

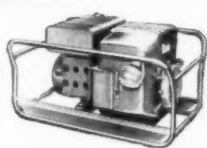
Write for folder on all CCK models



**D. W. ONAN & SONS INC.**

2862 University Avenue Southeast, Minneapolis 14, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 368



**PORTABLE MODELS**  
Available with carrying frames or 2-wheel dollies. Easily portable. Other Onan portable models: 500 to 10,000 watts.



Portable  
Model A

## "BERG" CONCRETE SURFACERS

FOR BRIDGES, DAMS, CULVERTS, HIGHWAYS, FLOORS, WALLS, AIRPORT RUNWAYS, AND OTHER APPLICATIONS

Models H-8 and H-10



## "BERG" for Quality Work at Low Cost

**MODEL A.** Lightweight, electric powered unit . . . suspends from operator's shoulder. Interchangeable heads and attachments for surfacing concrete buildings, bridges, dams, walls, culverts, etc. **MODELS H-8 and H-10.** One-man gasoline engine powered units for surfacing concrete highways, streets, floors, airport runways. Includes exclusive power take-off for attaching "BERG" flexible shaft equipment for surfacing bridges, walls, etc. Write today for descriptive literature on machines and attachments.

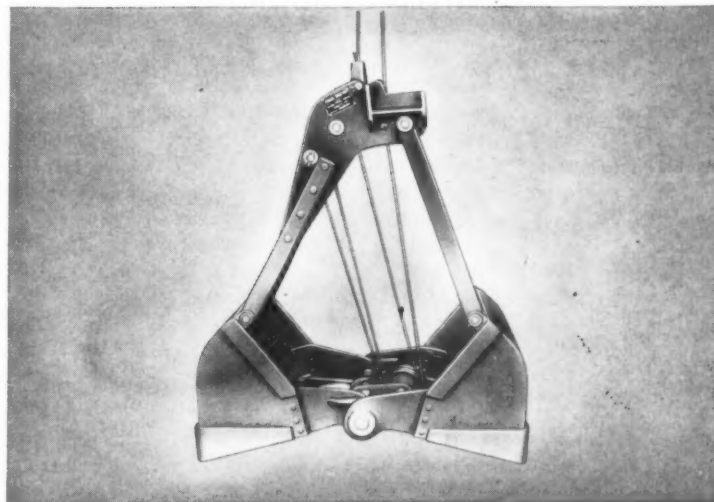
**THE CONCRETE SURFACING MACHINERY COMPANY**

4665-69 Spring Grove Ave., Cincinnati 32, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 369

## ATTENTION . . . Lightweight Crane Owners

## ERIE'S NEW 3/8 YD. CLAMSHELL GIVES YOU ALL THE FEATURES OF REGULAR 2-LINE MODELS



Quick Way, Shield Bantam, Sargent, Dixie, Little Giant, Mitey-Mite and other light weight crane owners—Erie's new 3/8 yd. bucket is built to help you get the most pay load out of your equipment.

Rigid, one-piece, welded head; thick, strong corner bars; over-size bearings; massive hinges and low silhouette—all the features that make ERIE buckets standard for the world—scaled to fit your requirements. You'll be agreeably surprised at the job this new bucket does. We who developed it were surprised and we expected a lot.

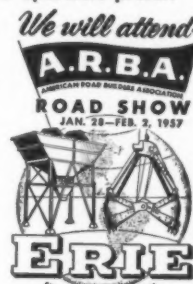
Once you try ERIE's new 3/8 yd. clamshell, we're sure you'll agree with us—it's the hardest digging, longest wearing and easiest handling bucket you ever rigged to a light weight crane.

Heat Treated teeth on all ERIE buckets are guaranteed for the life of the bucket against breaking. A new set if they break.

These features make ERIE the bucket experienced operators prefer:

1. Top closing power from block and tackle, plus lever arm construction, plus precision balancing.
2. Treated steel teeth and high carbon steel lips bite up full payloads even in clay and gumbo.
3. Rigid, one-piece, welded head that shrugs off bumps and jars. No shimmy. No wobble.
4. Two-line, continuous reeving. Adds up to 50% to cable life. Less down-time for reeving.
5. Low headroom for fast work in tight quarters; low center of gravity for easy positioning.

For catalogs, write Dept. CE76



**ERIE STRAYER CO.**

3276 GEIST ROAD • ERIE, PENNSYLVANIA

Makers of Light, Standard and Wide Rehandlers, General Purpose, Heavy Duty, Extra Heavy Duty, Electric and Mechanical Clamshells.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 370



## Weather charts

### The weather outlook for August

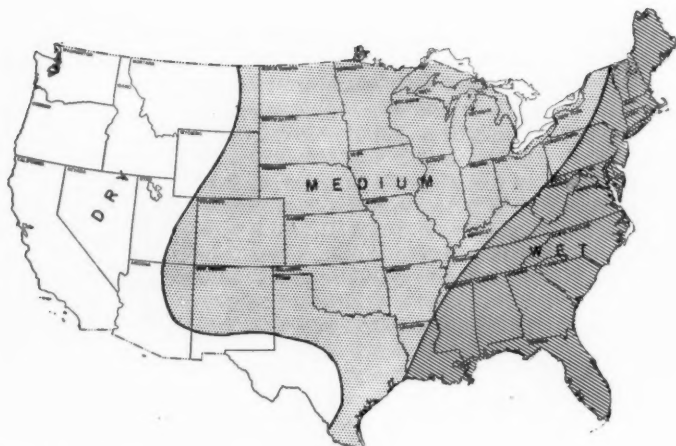


Chart I: Precipitation

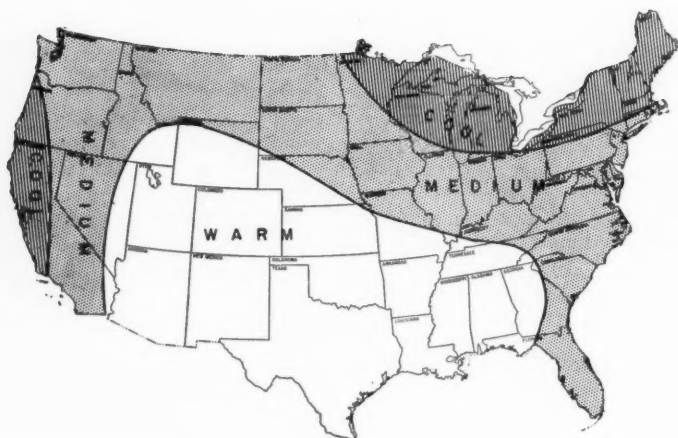


Chart II: Temperature

The two accompanying maps indicate the average weather conditions to be expected throughout the United States during the month of August. Showing the number of days with rainfall and the number when temperatures reach 90 degrees or more, the charts are indications of average conditions and are not intended to be specific forecasts.

Those areas indicated on Chart I as dry will average fewer than 6 days with rainfall. Medium areas will probably have between 6 and 10 rainy days, and wet regions can expect more than 10 days with rain. Most of this, however, will be brief afternoon showers, rather than all-day rains.

Warm areas indicated on Chart II will more than likely experience 10 or more days when the temperature

reaches 90 degrees or more. Between 2 and 10 90-degree days can be expected in medium areas, while 2 or fewer are predicted for cool regions.

Using the charts in a relative sense, a contractor may note that there will be more rain in New Jersey and southeastern New York than there will be in Arkansas. Colorado, however, will probably be drier than Utah. Kansas and Nebraska are expected to be warmer than Iowa and Illinois.

These charts are prepared for CONTRACTORS AND ENGINEERS by Weather Corp. of America, 39 Broadway, New York, N. Y., and 611 Olive St., St. Louis, Mo. Questions pertaining to the charts or to the applied uses of climatology may be referred to either of the corporation's two offices.

THE END

### Connolly promoted to B-K sales post

The sales engineer of the Heavy Steel Forms Department of Blaw-Knox Co., Pittsburgh, Pa., Richard S. Connolly, has been made assistant sales manager of the department.

Since joining Blaw-Knox in 1947, Connolly has worked as design engineer and sales engineer on many construction jobs on bridges, dams, vehicular and hydroelectric power tunnels, and thin-shell arch concrete buildings. A mechanical engineer, and a registered professional engineer in the state of Pennsylvania, Connolly formerly served two years as an en-

gineering officer in the U. S. Navy and a short time in the Marine Engineering Department of Dravo Corp.

### R. G. LeTourneau appoints two new sales executives

Two sales-management specialists have joined the staff of R. G. LeTourneau, Inc., Longview, Texas, to fill newly created positions.

Rodney A. Kox will direct sales activity for LeTourneau off-road transporters and cross-country freighters.

Thomas W. Miller will head the sales of the firm's line of logging products from Portland, Oreg.

### The NEW Wisconsin Tandem Trailer




12 ton tandem  
\$1500 w/ tires  
and deck.  
Plus freight and tax.

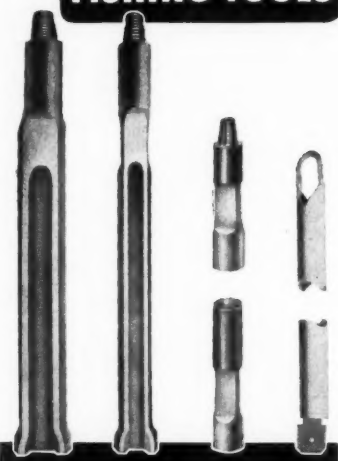
The new Wisconsin tandem axle trailer offers a more rugged frame, Timken Bearings inside the walking beam, Timken Bearings in the hubs, 1080 square inches of 1/2-inch frame, one-man loading, well-balanced platform, and many other outstanding features. All Wisconsin trailers are designed by professional engineers for your assurance of dependable, longer life trailers. The tandem trailer is ideal for transporting HD-6G, Cat 955 and 12 ton rollers.

WISCONSIN TRAILER CO., 1949 N. 121 St., Milwaukee 13, Wis.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 371



## DRILLING and FISHING TOOLS



for QUARRIES MINES WELLS

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LEBANON, PA.  
Telephone 2-3861

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Atlantic City, N. J.

One of America's Finest Hotels  
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### BRIGHTON POOL and CABANA CLUB

You will enjoy this friendly hotel right on the Boardwalk in the center of all activities.

Delicious Food served in an atmosphere of Charm and Hospitality.

Modified American and European Plans

COFFEE SHOP

COCKTAIL LOUNGE and BAR  
with Nightly Entertainment

The Home of the Famous Brighton Punch

Alfred A. Taxin, President

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write for further information

### Swenson Spreader & Mfg. Co.

Lindenwood, Illinois

## Speed Sealcoating Jobs with SWENSON SPREADERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 374

CONTRACTORS AND ENGINEERS

A STANDARD STEEL RB 6,000-POUND ASPHALT PLANT is the hub of this McCammon-Wunderlick Co. hot-mix setup near Palm Springs, Calif. Strung out from left to right are the power equipment shack, rock gates, crushers, conveyors, hoppers, and the Standard asphalt plant. Aggregates are separated into stockpiles located over a 200-foot-long tunnel with feeder gates. After rising from the tunnel on the conveyor in the center foreground, they are fed into the hopper, then into the rotary dryer, and finally

to the asphalt plant. For more information on the plant, write to the Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles 11, Calif., or use the Request Card at page 18. Circle No. 119.

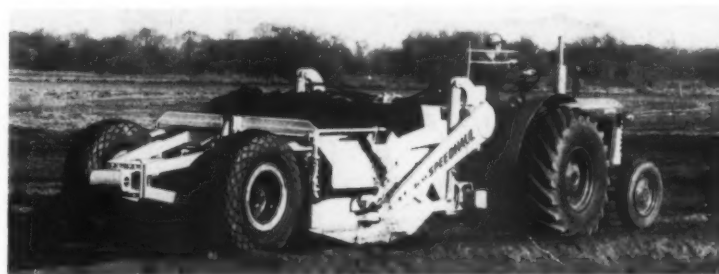


#### Four salesmen join Syntron

The Syntron Co., Homer City, Pa., has assigned four new salesmen to handle its line of vibratory equipment, conveyors, power tools, and other industrial equipment. Robert P. Walsh and Walter C. Ebert have been named to the staff of Syntron Detroit Sales Co. They will sell bulk material-handling equipment in the state of Michigan, Walsh covering seven counties and Ebert, three.

Working with the Syntron Philadelphia Sales Co., Lyle Taggart will be in charge of retail and resale vibratory equipment in South Jersey. William E. Belcher will work with the Syntron Ltd. Sales Co. office in Ontario, Canada.

A low center of gravity makes the Be-Ge Speedhaul scraper easy to maneuver, with less than a third of its entire loaded weight bearing on the tractor's rear wheels.



#### Small hydraulic scraper is easily maneuvered

A scraper recommended for use with the Oliver Super 99 and Super 99 G. M. tractors has been developed by the Be-Ge Mfg. Co. According to the firm, the low center of gravity of the rig permits safe, easy maneuvering with less than a third of the scraper's entire loaded weight on the tractor's rear wheels.

The Be-Ge Speedhaul scraper is available in two models. The Model 756 has a capacity of 4.2 cubic yards

struck and 5.6 cubic yards heaped. The Model 767 has struck and heaped capacities of 5.3 and 6.7 cubic yards, respectively.

Instead of levers or cables, both models are equipped with full hydraulic power, providing the operator with positive control.

For more information write to the Be-Ge Mfg. Co., Box B-1, Gilroy, Calif., or use the Request Card at page 18. Circle No. 177.

## TRADING POST

### CLASSIFIED ADVERTISING

An advertising inch in the Trading Post is measured 7/8-inch vertically on one column. Space reservation close in the New York office on the 10th of the month preceding publication. Send your classified copy to:

The Trading Post, Contractors & Engineers  
470 Fourth Avenue, New York 16, N. Y.

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In order to balance our equipment inventory, we are disposing of over 75 units including:

SHOVELS • DRAGLINES • CRANES  
CONCRETE & PAVING EQUIPMENT  
COMPRESSORS • BULLDOZERS  
LOADERS • TRUCKS • TRAILERS  
AND MANY OTHER ITEMS

Most Equipment Used On One Job Only  
Located in Phoenix, Ariz. and Alma, Colo.

Write, phone or wire for a complete list

FISHER CONTRACTING CO.

Attn: Jack E. Brown—  
Equipment Sales  
Phoenix, Arizona  
P. O. Box 6306  
Phone: ALpine 8-7741

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To handle a new line of industrial aerosols to manufacturers, contractors, and supply houses. Repeat sales. Protected territories, selling aids, national trade journal advertising, and point-of-purchase material available. Write for more information on this high-profit line.

Write: Box 504

CONTRACTORS & ENGINEERS  
470 Fourth Ave., New York 16, N. Y.

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TESTING ENGINEERS  
ENGINEERING GEOLOGISTS

Foundation Investigations—Laboratory Analyses and Evaluation of Construction Materials—Soil Mechanics, Concrete and Asphalt Technology. Field Inspection and Consultation.

Special Investigations for Dams, Turnpikes and Airports.

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#### SUPERVISOR AVAILABLE

Heavy construction supervisor available for U. S., Central or So. America. 22 years with major contractor. Thorough knowledge maintenance and operation of all types of equipment used in compacted earth fills, breakwaters and large dam construction. Very competent handling large crews of men. Age 50. Good health.

Write: Box 505, Contractors & Engineers  
470 Fourth Ave., New York 16, N. Y.

#### Wooden pallets described in literature

A wooden pallet that measures 24 x 32 inches, as recommended by the Mason Contractors Association of America, is described in a pamphlet from American Road Equipment Co.

The pamphlet lists the outstanding features of the pallets—their safety, ease of handling, low cost, ease of inventory, and savings in labor. Job photos of the company's Econmobile point out the unit's ability to palletize on any job location at various working heights.

To obtain the pamphlet write to American Road Equipment Co., 4302 N. 28th St., Omaha, Nebr., or use the Request Card at page 18. Circle No. 155.

#### Pressure regulators

Various models of pressure and volume regulators, by which pressures up to 4,000 pounds can be regulated, are featured in a folder from the manufacturer, The K-G Equipment Co., Inc. A diagram of a regulator points out the stainless steel filter, stem, and internal adjusting mechanism; neoprene "O" seal ring; and shock-absorbing adjusting knob. Also pictured are single and two-stage regulators, station regulator, and the Flowmeter for measuring inert gas.

To obtain the folder write to The K-G Equipment Co., Inc., P. O. Box 538, 1744 Lehigh St., Allentown, Pa., or use the Request Card at page 18. Circle No. 140.

A calendar of coming conventions appears on page 9 of this issue.

# RICE

The REALLY COMPLETE  
CONTRACTORS' LINE  
CENTRIFUGAL & DIAPHRAGM  
**PUMPS**

**CENTRIFUGALS**—All AGC Sizes 1½" thru 10". Complete Line Light-weights. All Power Options.

**DIAPHRAGMS**—2", 3" and 4" and the Big Double 4". Coming Soon a Super-line of Straight Centrifugals. Nothing Finer.

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for  
Bulletins

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For more facts, circle No. 375

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With FORMULA No. 640

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SELL used equipment  
ACQUIRE competent personnel  
through

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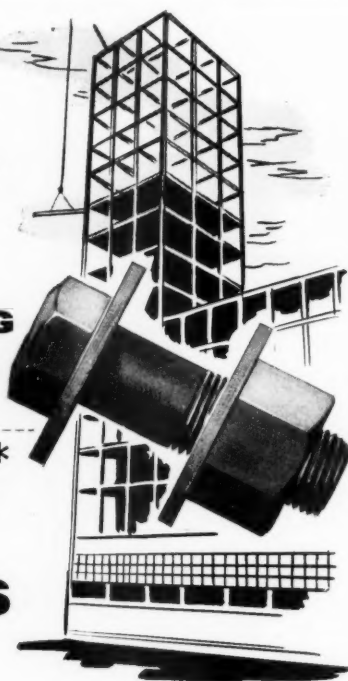
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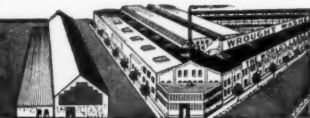
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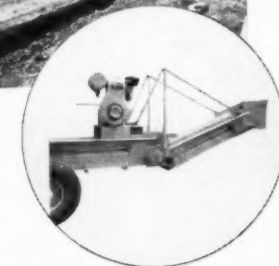


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... If you are trying to meet strict compaction specifications by adding more dead weight or making more passes with old fashioned equipment, your costs will keep mounting—but with modern TERRAPAC dynamic vibratory compaction you'll save hours of costly time on every job—do more work, more profitably!

### VIBRATION—A KEY TO COMPACTION COSTS.

Contractors using TERRAPAC vibratory rollers can usually put in two or three times the depth of fill that would be allowed with a static roller—then compact it faster, better and deeper in fewer passes... Dynamic compaction saves TIME!

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The TERRAPAC model CH30 weighs only 3½ tons yet will compact deeper, in fewer passes, than an ordinary 30 to 50 ton roller. Balance is so even that one man can lift either end... Vibration frequency can be regulated... Light weight permits easy handling on any type fill or soil plus rapid transport on any highway. Wide (58") roller... Diesel power.

## TERRAPAC VIBRATORY ROLLERS



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## BUCKET FULL OF PROFIT!

Omaha Dragline Buckets eliminate unnecessary weight which makes room for a bigger payload. A high arch gives more clearance for digging and dumping. Nearly 50 years of "know-how" enables Omaha Dragline Buckets to pass all actual field tests. You can't buy a better bucket!

Write today for catalog giving specifications for four types available.



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Washington got its first look at Fred A. Seaton in his new role as Secretary of the Interior when he appeared before the Senate Interior Committee on the question of his appointment. The committee asked him some tough questions before they unanimously confirmed his appointment by a voice vote.

Sen. Joseph C. O'Mahoney (D.-Wyo.) wanted to know Seaton's stand on the Hell's Canyon controversy. Was he for one big dam or for three smaller ones to be developed by the

Idaho Power Company?

Seaton replied that he had no personal prejudice about Hell's Canyon, adding that he knew so few of the facts that he couldn't help but have an open mind. But he said, "I do have to take cognizance of the fact that the Administration has taken a stand in the matter."

Sen. O'Mahoney went on to say that the Administration has cooperated "magnificently" in approving the law for the Upper Colorado River Basin, but he called its stand against the

high dam in Hell's Canyon "a completely contrary policy." Sen. Arthur Watkins (R.-Utah) disagreed.

The Secretary made it emphatically clear that he embraces the Administration's concept of a "partnership power program". It is quite impossible, he believes, for the federal government to assume the full cost and responsibility of building major dams and irrigation projects.

The concept, he explained, is "very simple"; it is nothing more than a partnership of the federal government

with municipalities, with public power districts, with REA's and with private power companies in the construction—and occasionally operation—of power projects.

Seaton's appointment was hailed as a brilliant political move by most Washington observers. An articulate newspaper and magazine publisher, he can be relied on to stick to the facts in answering questions about Interior policy. The press knows him as a man who won't sidestep questions if he knows the answers. Seaton identifies himself as a "liberal conservative", which means he admits the necessity for federal aid in certain areas, but is cautious about free-handed spending.

One of the Secretary's major concerns is water. Although the Senate did not question him on his plans, he is going to take action to step up research on transforming salt water into fresh.

Water also has been a major concern of the House Public Works Committee this session. Its report on a bill to extend the Water Pollution Control Act is filled with grave warning.

Noting that pollution can be just as important a factor as drought in reducing a nation's water supply, the House group said pollution control is now recognized as a key to our water conservation problem.

The report stated these facts about the extent of pollution:

(1) In 1955, the equivalent of raw sewage from nearly 55 million persons was being discharged into U. S. waters.

(2) The same year, organic industrial waste accounted for a pollution load equal to the raw sewage from 110 million persons.

(3) Inorganic wastes in our rivers and streams are on the increase each year. In addition to acids, toxic metals, and cyanides, radioactive materials are also being discharged today.

(4) Projects to meet the backlog of needs for sewage-treatment plants and intercepting sewers would cost more than \$1.9 billion. Another \$1.7 billion will have to be spent by 1965 to replace obsolete plants, and still another \$1.7 billion to meet the needs of an expanding population. Total sewage-treatment spending by 1965 would total about \$5 billion.

(5) Approximate cost of new sewer systems and extensions needed by 1965 will be about \$5.5 billion.

To help local governments meet these sewer needs, House Democrats launched a new plan to permit the Surgeon General to make grants to states and cities for the construction of sewage-treatment works. The grant could amount to half the cost of the project.

The bill authorizes annual appropriations of \$100 million during each of the next five years, and federal aid for areas where the greatest public



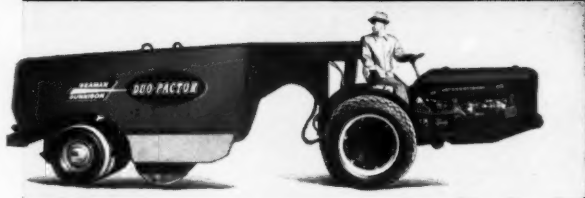
Tractive power *plus* was proved by this contractor on his Mitchell Field Airport job here in Milwaukee, Wis., towing a fully loaded 8-ton pull-type pneumatic tired roller behind his fully ballasted 19 ton DUO-PACTOR, thus nearly completing compaction in one pass. Tests proved Duo-Paction method exceeded compaction specifications with less rolling time. Test ran from 99.7% to 102.1% of proctor.

DUO-PACTION is the process of rolling alternately with steel and rubber, producing greater densities and smoother surfaces.

DUO-PACTOR with its large diameter power roll tires provides the necessary traction in loose materials. The rear trailing roll tires being smaller and unequally spaced prevent direct tracking. The 8 rear tires are spring-mounted in pairs, torsionally controlled, which means a more uniform transverse density obtained because the most pressure is applied to the highest point. After preliminary pneumatic-tired rolling, the steel roll is lowered to press down the ridges and level the surface for finish pneumatic rolling.

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with the**

**DUO-PACTOR**



INTERNATIONAL Model "300" utility tractor with torque amplifier speeds up work by giving you added power-punch to handle tough spots on-the-go . . . by giving you a choice of two speeds in each gear to utilize full power for maximum capacity.

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Manufacturers of the Duo-Pactor, Swing-Bar Distributors and Hydro-Jet Flushers.

benefit would accrue, regardless of the ability of the locality to finance the whole project alone.

House Republicans have denounced this proposal as the beginning of a new, gigantic program for federal grants-in-aid.

"At a time when most people, including legislators, talk about a reduction in spending," pointed out a minority report, "the bill embarks the federal government not only upon a new spending spree but also upon an entirely new federal activity."

Although the bill calls for \$500 million in appropriations, Republicans warn that building sewage-disposal plants for all municipalities in the United States will obviously cost far more than that in federal aid. Cincinnati alone, they reminded Democrats, spent \$50 million for its recently-completed sewage-disposal plant.

Republicans also questioned:

(1) If cities that have already built modern disposal plants are to be penalized for their progressivism;

(2) The inability of states and municipalities to build their own plants without help;

(3) Whether the federal government, whose debt exceeds the combined debt of all states and cities, can afford to pay for local needs.

In its present form, the House bill would seem to have little chance of making the grade, but the proposal will surely be made again during the next few years. If states and cities do not move ahead to do something about their own water-pollution problems, federal money will move into still another area where local money would do just as well.

Certainly the federal government is involved in enough projects now; the backlog of public works with which it is already concerned—and this excludes military projects—exceeds \$80 billion. Three-fourths of this amount is in the water-resources field—navigation, flood control, watershed management, and irrigation.

In a recent Washington speech, Maj. Gen. J. S. Bragdon, special assistant to President Eisenhower, said that there are now more than forty federal agencies engaged in public works, along with 109,000 local-government units. But all these groups don't necessarily bring action.

Gen. Bragdon said that at present rates of public-works construction, it will take the U. S. 24 years to catch up with current requirements. To meet our needs by 1965, we will have to start today to more than double our rate of building.

To handle the demanding public-works problem the U. S. faces today, Gen. Bragdon said a new White House Public Works Planning Unit has been formed. One job of this unit will be to work out a method of determining the relative urgency of the various public works projects already authorized.

Responsible federal agencies are also working with state and local officials to develop criteria for public-works needs, he explained.

"It is necessary that we carefully husband our construction dollar and spend it prudently on those things

which we most need rather than on those things which we would merely like to have," Gen. Bragdon declared. He added that the need for long-range planning to obtain integrated, comprehensive, and sound development becomes more generally recognized

and more pressing as our construction requirements increase.

There is no assurance, of course, that, after the construction priorities are determined, Congress will obediently make the necessary appropriations.

THE END

## DW15s move earth fast at Fort Gaines Dam



THE Fort Gaines Lock and Dam project on the Chattahoochee River is now going ahead in high gear. Moss Construction Co., of Columbus, Ga., building a 5400-foot section of the dike on the Alabama side, is moving earth at the rate of over 1000 cu. yd. per hour, and expects to double that figure this summer. Total yardage on the Moss contract will be about 2¼ million.

A major share of the earthmoving is handled by six CAT\* DW15 Tractors with No. 15 Scrapers. Push-loaded by D8s, these units have carried average loads of 13.5 cu. yd., working in loose sand. Round-trip haul distance is about 3200 feet. This will lengthen as the job progresses, but in clay and other random material, loading will be faster. Good 60-foot-wide haul roads are maintained by Caterpillar Motor Graders.

In all, some 32 pieces of Cat equipment are at work here. W. P. Moss, managing partner of the construction firm, likes the performance of his DW15s. He praises their ease of handling, operator comfort and balance of weight to horsepower. "I have used Cat machines for over 20 years," he says. "The fact that my present equipment is all Cat is due to my belief

that Caterpillar leads the field in design, quality control in manufacture and, most important, in service."

The DW15 is in all ways a modern heavy-duty earthmover. It gives you a dependable Cat Engine with 186 HP (maximum output); new tubeless tires on drive and scraper wheels that eliminate tube and flap trouble and reduce down time; fast, easy-operating controls and 10 forward speeds. It has won acceptance everywhere on its profitable performance.

Ask your Caterpillar Dealer for a demonstration on your own job. He backs the DW15, like all the machines he sells, with service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR\*

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NAME THE DATE...  
YOUR DEALER  
WILL DEMONSTRATE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 381





*One Michigan replaces two crawlers and grader . . .*

## **Clean-up costs threatened profits until Calif. contractor bought this 2 $\frac{1}{4}$ yd. Michigan**

Due to the nature of the job specifications, excavating contractor Kirby-Erwood Co. (Van Nuys, Cal.) faced a substantial clean-up problem in adding two outside lanes to the Foothill Freeway in southern California. Recognizing the advantages of a single machine with speed and power to keep clean-up costs from getting out of hand, they asked distributor Smith Booth Usher to demonstrate a 2 $\frac{1}{4}$  yd. Michigan Tractor Shovel. When they saw, they bought.

### **Tough specifications**

To keep traffic moving, State specifications called for at least a  $\frac{1}{2}$ -mile of wide-open, uninterrupted highway free of all construction activities any time

Using a length of chain, the Michigan operator easily broke loose this 2-ton chunk of concrete, carried it 2 miles to the dump.

Kirby-Erwood switched work from one side of the highway to the other. Still, it was often necessary to work alternate sides of the highway because of timing as utilities were moved.

There was excess excavation as each section was temporarily and permanently completed—broken concrete from old structures and large boulders dug up by excavating equipment. To meet the specifications under these conditions, clean-up work had to be fast and highly productive.

### **Michigan replaces crawlers**

The 27-mph Michigan has replaced two crawler-loaders on clean-up. In many sections the Michigan does its own grading and scarifying of old bituminous shoulders, eliminates considerable grader work. The Michigan travels along a pavement at high speed, picks up boulders and cobbles which formerly had to be gathered and windrowed by a grader and loaded by the crawlers. In terms of economy, the Michigan operator *does the work of two crawler operators and much of the work of a grader operator.*

### **How to cut costs**

Kirby-Erwood's Michigan does more than help them meet job specifications: it cuts many dollars of expense from this \$612,000 freeway project. By handling clean-up work efficiently, the Michigan prevents this expense item from eating into job profits.

With Clark torque converter, power-shift transmission and planetary-wheel axles standard on all models, Michigans deliver more usable power, traction and speed than any machine of this type. If you're willing to be convinced that this machine is in a class by itself, do what Kirby-Erwood did; *ask for a demonstration.* You name the job!

Michigan is a registered trade mark of  
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